THE AMERICAL FIREPROOFING COMPANY,

Petitioner,

vs.

THE EXPANDED METAL COMPANY,

Respondent.

Petition for Writ of Certiorari; and Citation of the Decisions of the Circuit Courts of Appeal Alleged herein to be Conflicting.

THOMAS W. BAKEWELL,
GEORGE H. CHRISTY,
Solicitors and of Counsel for Petitioner.

S. C. Stanwood, 39 to 51 Spring Street, New York.

IN THE

Supreme Court of the United States,

IN EQUITY.

OCTOBER TERM, 1908.

THE GENERAL FIREPROOFING COMPANY,
Petitioner,

vs.

THE EXPANDED METAL COMPANY,
Respondent.

Notice to Respondent.

TO THE EXPANDED METAL COMPANY, THE ABOVE NAMED RESPONDENT:

Take notice that on Monday, November 9th, 1908, at the opening of the Court on that day, or as soon thereafter as counsel can be heard, a petition for writ of *certiorari*, of which petition a copy is annexed, will be submitted to the Supreme Court of the United States. In support of said petition a brief will also be presented to the Court. A copy of said petition and brief are herewith served upon you.

THOMAS W. BAKEWELL,
GEORGE H. CHRISTY,
Solicitors and of Counsel for Petitioner.

Due and timely service of the foregoing notice and copies of the petition and brief therein mentioned are hereby admitted.

ERNEST HOWARD HUNTER,
Solicitor for Respondent.

Petition for Writ of Certiorari.

TO THE HONORABLE, THE CHIEF JUSTICE AND THE ASSOCIATE JUSTICES OF THE SUPREME COURT OF THE UNITED STATES:

Your petitioner, The General Fireproofing Company, respectfully shows unto this Honorable Court, as follows, to wit:

1. That conflicting decisions have been rendered by two United States Circuit Courts of Appeal in suits in equity duly brought in two of the Circuit Courts of the United States (and after hearing and decision, duly appealed) each for the alleged infringement of certain Letters Patent of the United States, No. 527,242, issued to John F. Golding under date of October 9th, 1894, for a "Method of Making Expanded Sheet Metal."

In one of said two decisions, made by the Circuit Court of Appeals for the Third Circuit, the said patent was held to be *invalid* and *void*, and the bill of complaint was ordered to be dismissed.

In the other, by the Circuit Court of Appeals for the Sixth Circuit, the same patent was held to be *good* and *valid*, and a decree for an injunction and an account was ordered to be entered against the defendant.

Your petitioner was defendant in this latter suit.

The said conflicting decisions remain in full force and unreversed.

2. In the first adjudicated of said two cases, the said Expanded Metal Company, a Missouri Corporation (Respondent herein) as assignee of said patent, No. 527,242, and Henry Chess *et al.*, of Pittsburg, Pennsylvania, composing the firm of Chess Brothers, as exclusive licensees under the said patent, for the State of Pennsylvania and elsewhere, filed their bill of complaint in the United States Circuit Court for the Eastern District of Pennsylvania, on April 30, 1903, against Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas Schmucker, for the infringement of said Letters Patent, the prayer of said bill being for an injunction and an accounting.

3. The said defendants answered, denying infringement, and alleging the invalidity of the patent for want of utility,

lack of patentable subject matter as a method or process, and anticipation and lack of invention in view of the prior state of the art.

The case was heard on the pleadings and proofs, and on March 30th, 1905, his Honor Judge HOLLAND, filed an opinion sustaining the bill and in pursuance thereof a decree was entered for an injunction and an account of damages and profits. The said opinion is reported in 136 Federal Reporter, 870.

4. Defendants therein appealed to the Circuit Court of Appeals for the Third Circuit from the decree of the Circuit Court, and filed assignments of error attacking the decree, *(a)* on the issue of infringement; *(b)* on the issue of the validity of the patent in view of the prior state of the art, and *(c)* on the issue of patentability of the subject matter as a process or method.

After hearing in the Court of Appeals, a decision was rendered by the said Court, holding that the said patent No. 527,242 was invalid and void, reversing the decree of the Circuit Court, and ordering a decree to be entered dismissing the bill of complaint. The issue of infringement was not adjudicated. The said opinion of the Court of Appeals is reported in 146 Federal Reporter, 984, and a copy thereof is annexed to this petition.

By writ of *Certiorari*, the said case was subsequently removed to the Supreme Court, where it is still pending as No. 289, October Term, 1907.

5. In the other of said two adjudicated cases, the said Expanded Metal Company, on or about February 9, 1904, filed its bill of Complaint in the United States Circuit Court for the Northern District of Ohio against your petitioner, an Ohio corporation, a manufacturer of Expanded Metal (so-called), alleging *inter alia*, the infringement by your petitioner of said patent No. 527,242.

Your petitioner in due time filed its answer to said bill, denying *inter alia* the validity of said patent, and denying that your petitioner had infringed the same, and after the joinder of issue and the taking of proofs on both sides, the case was heard by his Honor Judge TAYLER, who subse-

quently rendered his decision holding the patent *void*, and thereupon a decree was entered dismissing the bill. The opinion of the Court is reported in 157 Federal Reporter, 564.

Thereupon complainant in said case(the respondent herein) appealed.

After hearing of said appeal, the Circuit Court of Appeals for the Sixth Circuit rendered a decision on or about October 6th, 1908, holding the said patent to be good and valid, reversing the said decree of the Circuit Court, and ordering that a decree be entered for an injunction and an account against the defendant (the petitioner herein). A copy of the opinion of the said Circuit Court of Appeals is annexed hereto.

The opinions of the Circuit Courts of Appeal in the causes above recited are inconsistent and conflicting. In the said decision of the Court of Appeals of the Third Circuit the Court said : " We think that the principles laid down by the Supreme Court in *Risdon Iron Works vs. Medart*, 158 U. S., 68, and the other cases both in that court and in the lower courts which have recognized these principles as valid—many of them are cited in the appellant's brief—require the reversal of the decree appealed from with instructions to the Circuit Court to dismiss the bill."

The Circuit Court of Appeals for the Sixth Circuit, in their opinion in this present cause, ruled, on the contrary, that the patent in suit was not granted in violation of the principle stated by this Honorable Court in *Risdon Locomotive Works vs. Medart*, 158 U. S. 68, and said in their opinion :

> " We think the invention may rightly and aptly be characterized as an improvement in the art of expanding sheet metal and is within the letter and spirit of the statute."

And the Court further said :

> " As we understand the case of *Risdon Locomotive Works vs. Medart*, nothing is there decided which is in conflict with these views."

Your petitioner therefore submits that there is direct conflict of opinion and decision between the said Courts of Ap-

peal in respect of the principle of law stated by this Court in Risdon Locomotive Works vs. Medart, the Court of Appeals for the Third Circuit holding that the patent in suit is invalid by reason of said decision of this Court, and the Court of Appeals for the Sixth Circuit holding that said patent is not invalid, but that the invention covered thereby is substantially different in character from the invention involved in the Risdon-Medart case.

6. Thus it appears that the manufacturing business in which your petitioner has been largely engaged (as more fully to be stated presently) has now been adjudged by the Circuit Court of Appeals for the Sixth Circuit to be unlawful if carried on without license under said letters patent No. 527,242; and has been adjudged by the Circuit Court of Appeals for the Third Circuit, to be lawful. Your petitioner is advised and believes that such conflict of decisions involves an evil which ought to be corrected and which it is the particular province of your Honorable Court to correct, and one which justifies your petitioner in submitting the present petition.

7. Your petitioner further represents that through the efforts of its officers and counsel, it has acquired a good knowledge of the facts and issues involved in the said cause now pending in your Honorable Court on writ of *certiorari* to the Circuit Court of Appeals of the Third Circuit as above stated; that while the issue of the validity of said patent No. 527,242, may in such case be finally adjudicated by your Honorable Court, it is also true that it may not be so adjudicated, and this for the reason that in said cause the issue of infringement is strenuously denied on the part of defendants therein, and, as your petitioner is advised and believes, such denial is well founded. Hence an adjudication by your Honorable Court, in the said cause pending on writ of *certiorari* to the Circuit Court of Appeals of the Third Circuit, that the defendant therein has not infringed the said letters patent (if such should be the conclusion), in that it would finally dispose of said cause, might leave the validity of the patent unadjudicated, and the conflict of decisions consequently unrectified.

And your petitioner is advised that on account of this contingency or uncertainty, your petitioner cannot safely and

advisedly await your Honor's decision of the said cause now pending in this Court, before submitting the present petition.

In the present cause, pending in the Sixth Judicial Circuit (wherein your petitioner is defendant), the defendant's machine and the steps employed in its manufacture of expanded metal differ from those involved in the case in the Third Circuit, so that an adjudication upon the question of infringement in the cause in the Third Circuit would not apply to the present cause pending in the Sixth Circuit.

8. Your petitioner further represents that the proofs as contained in the record in this present cause on the issues involved are much fuller and more complete than the proofs in the record of the said cause now pending in this Court on writ of *certiorari* from the Circuit Court of Appeals for the Third Circuit, and that the fuller proofs contained in the present record bear directly upon the relation of the patent in suit to the prior state of the art and the nature of the patented invention; and by reason thereof your petitioner submits that a correct adjudication by this Court of the issues involved in the conflicting decisions above referred to will be greatly facilitated by a consideration of the record herein.

9. Your petitioner further represents to your Honorable Court that the said decisions affect a large number of important manufacturing interests. In the averments of the petition of a writ of *certiorari* in the said suit against E. S. Bradford and others it is made to appear that the Expanded Metal made and sold in the United States, during the year ending December 31st, 1907, and claimed to be covered as respects its manufacture by the said patent No. 527,242, amounts to over twenty thousand tons in weight, and this product would measure approximately sixty million square feet in superficial area; and at the average selling price, would have a value of about one million dollars.

10. Your petitioner being in the business of making and selling fire-proofing material of various kinds, and being first advised by counsel that the said patent No. 527,242 was invalid, and that your petitioner's machine was unlike the machine disclosed in said patent No. 527,242, about the

year 1903 entered into the business of making and selling as a part of its fireproofing business, a building material generally known in the trade as Expanded Metal; that it has in good faith continued in the business ever since; that it has invested much capital and expended much labor and expense in the business, and has built up a good trade; and on account of these facts, the said adjudication by the Circuit Court of Appeals for the Sixth Circuit against your petitioner, unless reviewed by your Honorable Court, and, if found to be erroneous, corrected, will work irremediable hardship to your petitioner, and to sundry other makers of like material as well.

11. Your petitioner further represents unto your Honors that the said decision of the Circuit Court of Appeals for the Third Circuit, holding the said patent No. 527,242 to be invalid and void, was correct both in fact and in law.

And, your petitioner further represents, that the said decision of the Circuit Court of Appeals for the Sixth Circuit was incorrect and erroneous, and *inter alia*, in that:

FIRST: The said Circuit Court of Appeals for the Sixth Circuit failed to give due weight to the fact, fully appearing in the proofs, that every step and element of the said patented method or process, as the same are enumerated in the single claim of said patent, was at and prior to the date of the said patented invention, publicly well known in and as a part of the Expanded Metal art.

SECOND: That no one of said elements changed or modified the action of any or all of the other of said elements.

THIRD: That the said Circuit Court of Appeals for the Sixth Circuit did not apply correctly to such facts the rules of law as respects the proper construction of such method claims, as such rules are formulated in the reported decisions of your Honorable Court; whereas if such correct application had been made, the said patent, as your petitioner verily believes, would and ought to have been held, as previously held by the Circuit Court of Appeals for the Third Circuit, to be void and invalid.

FOURTH: Doubtless through inadvertence, sundry errors of fact appear in the decision of the Circuit Court of Appeals of the Sixth Circuit; and *inter alia* the following:

(1) The Golding and Durkee patent dated June 16, 1885, is the only patent cited by said Court as exemplifying the

prior state of the art material to the case. As this Golding and Durkee patent says nothing about stretching the strands beyond the stretching incident to slitting, it would seem to follow that such further stretching was regarded by that Court as an element of novelty in the patent in suit. Such conclusion is erroneous, and the error is a material one. In the patent of Ohl, No. 475,700, dated May 24, 1892 (Rec., p. 496), *relating to the same art*, strands (here called "strips") are formed, as stated in the specification, by "shearing the edges of the strip from the sheet, at the same time *stretching the strip longitudinally*" etc. (Spec., p. 1, lines 39–41).

All the other steps of the claim of the Golding patent in suit being old in the prior art, it is submitted as matter of law that the addition thereto of Ohl's stretching, while it may make a new machine, does not make a new method or process within the meaning of the patent law.

(2) A single sentence from the latter part of the decision of the Circuit Court of Appeals for the Sixth Circuit (after a quotation fron the opinion of this Court in *Risdon Locomotive Works vs. Medart*, 158 U. S., 68), reads as follows:

> "The vital differences between such an invention and this are, that in this a new and different result is produced, a difference so great as to supplant all previous results."

Herein, your petitioner represents, that two errors are contained, both of which underlie the final conclusion of the Court and the final disposition of the case—

(*a*) In that the Court found that by the invention of the patent in suit, "a new and different result is produced"—the fact being that *in re* Expanded Metal, as shown by exhibits in evidence, the same product is produced by the alleged method of the patent in suit as by methods and machines previously known and used in the art.

(*b*) In that the Court found that this difference is "so great as to supplant all previous results."

Whereas the uncontradicted proof in this cause is that the older Golding and Durkee machines are now largely in use and have not been supplanted (Rec., p. 329, Q. 11; p. 297, Q. 40; pp. 300, 301, Qs. 56–59).

(3) Different findings were made by the said two Courts as to the mechanical showing of the patent in suit. Thus in the decision of the Circuit Court of Appeals for the Third Circuit, it was found in substance and effect that the patentee, in the specification of the patent in suit, did not explain save in a rudimentary and insufficient way how the metal was to be opened and stretched until he made his application for a machine to put his idea into practice. The Circuit Court of Appeals for the Sixth Circuit in the present case held directly the reverse. In respect of this, a material question, it is submitted that the decision of the Circuit Court of Appeals for the Sixth Circuit herein contains material error.

And for greater particularity your petitioner prays that reference may be made to the Brief of counsel filed herewith.

12. The question involved in this case relates to the patentability of methods or processes which consist of a series of physical steps or operations, each severally old in the same art, and all performed in succession by a particular kind of machine upon a specified article of commerce with no other result than to change its form and to produce a previously known product. And while your petitioner is advised and believes that as respects that particular question so arising on such facts, the decisions of your Honorable Court heretofore rendered are not open to reasonable doubt or uncertainty, your petitioner is also advised and believes that the decisions of sundry of the subordinate Federal Tribunals seem to indicate the existence in such tribunals of doubt or difference of opinion as to the intended meaning of the decisions of this Court relative to said question; and it is of the utmost importance to the business and manufacturing interests of the country at large that all occasion for such doubt and difference of opinion be removed.

As a single illustrative case of such doubt and uncertainty, your petitioner inserts herein an extract from a decision of the Court of Appeals for the District of Columbia, in *ex parte Weston*, 17 App. D. C. 431, as follows:

> "Numerous other cases have been cited to us wherein the Patent Office has issued patents for processes of a

merely mechanical character as distinguished from processes of elemental or other similar action ; and it seems to us that, *in the absence of any distinct and positive utterance from the Supreme Court of the United States* limiting patentability to processes of the latter character, it is not improper that the practice should be continued."

Your petitioner is reliably informed that in respect of the granting of patents for mechanical methods (so-called) the United States Patent Office "*in the absence*", as stated in the decision just quoted, "*of any distinct and positive utterance from the Supreme Court of the United States,*" etc., and following the concluding ruling, that "*the practice should be continued*", has been and still is granting many patents which under the decisions of your Honorable Court, are issued for non-patentable subject matter, and are void.

And the continued issue of such patents is contrary to the public interest in that it tends to and facilitates the establishment of unjust monopolies, and promotes undesirable litigation.

All this seems likely to continue indefinitely, unless your Honorable Court shall give some further "distinct and positive utterance" in respect of said matters.

13. Not to increase the labor of your Honorable Court, it is the desire of your petitioner that both the two cases referred to, be argued as one, and in due time, if the writ herein prayed for be granted, effort will be made to that end. And as counsel are the same in both cases, it is confidently anticipated that in such event it may be accomplished.

14. Your petitioners accordingly represent unto your Honors that the matters and things thus enumerated as matters of error, are matters of irreparable injury to your petitioner, and also as matters of great public importance, are matters which only your Honorable Court can correct.

WHEREFORE, your petitioner respectfully prays that a writ of *certiorari* may be issued out of and under the seal of this

Court directed to the United States Circuit Court of Appeals for the Sixth Circuit, commanding the said Court to certify and send to this Court, on a day certain to be therein designated, a full and complete transcript of the record and all proceedings of the said Circuit Court of Appeals in the said case therein entitled The Expanded Metal Company, Appellant v. The General Fireproofing Company, Appellee, No. 1783, to the end that the said case may be reviewed and determined by this court as provided in section 6 of the act of Congress, entitled "An Act to establish Circuit Courts of Appeals and to define and regulate in certain cases the jurisdiction of the Courts of the United States, and for other purposes," approved March 3, 1891, or that your petitioner may have such other or further relief or remedy in the premises as to this Court may seem appropriate and in conformity with the said act, and that the said judgment of the said Circuit Court of Appeals in the said case, and every part thereof, may be reversed by this Honorable Court.

A certified copy of the Record herein is filed herewith as part of this application.

And your petitioner will ever pray.

GENERAL FIREPROOFING COMPANY,
By ALEXANDER P. WHITE,
Vice-President.

THOMAS W. BAKEWELL,
GEORGE H. CHRISTY,
Solicitors and of Counsel for Petitioner.

UNITED STATES OF AMERICA,
Southern District of New York, } ss.:
CITY AND COUNTY OF NEW YORK,

ALEXANDER P. WHITE, being duly sworn, on oath deposes and says, that he is vice-president of the General Fireproofing Company, the above named petitioner; that he has read the foregoing petition and knows the contents thereof; and that the same is true in substance and in fact, except as to those

matters therein alleged to be stated upon information and belief and as to such matters affiant verily believes the same to be true.

ALEXANDER P. WHITE.

Subscribed and sworn to before me this 4th day of November, A. D. 1908.

A. E. WALLACE,
Notary Public for Kings County.
Certificate filed in New York County.

[Notarial Seal]

We hereby certify that the foregoing stated grounds in support of the petition for writ of *certiorari* in the above entitled cause are in our opinion well founded in point of law.

GEORGE H. CHRISTY,
THOMAS W. BAKEWELL,
Counsel for Petitioner.

UNITED STATES CIRCUIT COURT OF APPEALS,

Sixth Circuit.

The Expanded Metal Company, Appellant, v. The General Fireproofing Company, Appellee.	Appeal from the Circuit Court of the United States for the Northern District of Ohio.

Submitted June 5, 1908.
Decided October 6, 1908.

Before Lurton, Severens and Richards, Circuit Judges.

Severens, Circuit Judge, delivered the opinion of the court.

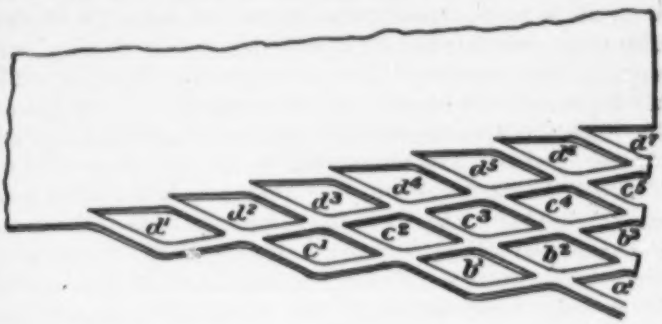
This is a suit brought by the owner of Letters Patent No. 527,242, granted October 9, 1894, to John F. Golding, for a "Method of Making Expanded Sheet Metal," complaining of the infringement thereof by the defendant. In the court below the patent was held to be invalid upon the grounds stated by the Circuit Court of Appeals for the Third Circuit in its opinion in the case of Bradford v. The Expanded Metal Company, the complainant here, reported in 146 Fed., 984.

On this appeal much reliance is placed by the appellee upon the decision in that case, and rightly so, for this court would be strongly inclined to follow a decision of that learned court, if made of the same questions and upon the same record as presented in the case before us. The question of the validity of the patent, is the same; but we have no means of knowing what evidence was adduced in the case in the Third Circuit and so are unable to determine to what extent, if at all, our duty to follow that court should constrain us. At all events, our impressions upon the questions involved are so strong that we feel compelled to express an independent judgment.

The art of expanding sheet metal had made considerable progress at the date of Golding's invention; and the product

had been used for various purposes, such as lattice work, trellises, screens, fencing, lath and the reinforcement of concrete structures. In general it may be said it consisted of slitting sheet metal into narrow strands by making more or less short, parallel slits of equal length along the length of the sheet alternately, that is, in such way as that each alternate line of slits should equally overlap the ends of the adjacent slits in the first line of slits and so on until the sheet was slitted. The sheet was then stretched laterally, the result being that the slitted strands and the uncut portions between them formed diamond-shaped meshes of nearly equal size and shape, but not of the desired uniformity, owing, doubtless, in large measure, to the variations in the thickness and texture of the sheet of metal. The sheet was shortened somewhat, but made much wider. This method had been improved upon, and notably by an invention of Golding and Durkee, patented by Letters No. 320,242, dated June 16, 1885. We shall not stop to enter into a further description of other earlier methods, which were the subjects of patents in this and other countries, for the reason that it sufficiently appears that the Golding and Durkee invention just mentioned was the most advanced and had proved the most successful at the date of the invention, which is the subject of the patent in suit. It seems desirable to describe the Golding and Durkee invention, patented in 1885, as we think it is the proper datum from which to reckon the novelty and utility of the subsequent invention of the Golding patent involved in the present suit. It consisted in "beginning at one side and corner and making an incision within the side of the metal, thus forming a strand which is simultaneously pressed away from the plane of the metal in a direction at or near a right angle, the position the strand assumes depending upon the distance it is moved from the plane of the metal. a^1 in the drawing shows the first cut made. The next step in this process is to make additional incisions, as is shown at b^1, b^2 and b^3 in the figure here attached, further within the plate of metal, and leaving uncut sections at the ends of the cuts, and simultaneously with the cutting, the strands are pressed away from the plane of the metal at the angle and to the desired position, as above described. Thus, each row of meshes is simultaneously cut and formed from a blank piece of metal without buckling or crimping the

blank. In the act of cutting and forming the meshes, the finished article is contracted in a line with the cuts or incisions, and consequently it is shorter in this direction than the piece from which it was cut, but is greatly lengthened in a line at an angle to the plane of the original sheet plate or blank."

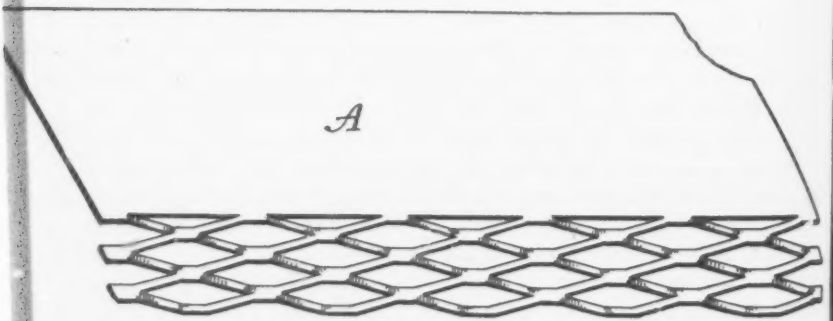


It is material to the purpose to observe (what will be presently seen) that by this method the strands are not strained by lengthening them, or if so, not beyond what is incident to the slitting and crowding them out. On the contrary, the strands, when cut and crowded out, pull all their attachments near and far (or so far as the already cut parts of the blank extend) and is the cause of the shortening of the sheet; and as the slitting and forming of the several meshes is going on at the same time, it is obvious that with all the severed parts exposed to the strain of the operation, irregularities in the result from buckling and crinkling in the severed parts, would probably occur. And the testimony shows that this was the result manifested by the process in operation. The sheet of metal was somewhat contorted and materially shortened.

The object of Golding's present invention was to so order the process of slitting and bending the strands to their place as to prevent the distortion of the sheet and preserve its length and the regularity of its outline and of its meshes. To do this, he proposed to avail himself, as he says, of the capacity of the metal to lengthen and be bent under strain without materially impairing its strength. The method he proposes is this: He begins near one corner of the sheet and cuts a straight

line of slits of equal length and distance apart near the edge of the sheet and along its length, and simultaneously with the cutting of each slit, bending off and down the several strands into the form of one-half of a diamond-shaped mesh. He then repeats the same operation by slitting a line of slits parallel to the first, except that the middle of the length of each of his slits will be made opposite the space left uncut in the first operation, and simultaneously with this second slitting, each severed strand is turned off and down to form the other half of the diamond-shaped mesh. By a continuation of this process the whole sheet is expanded without shortening and in regularly shaped meshes. The advantages of this process are obvious. They result from the circumstance that every time a slit is made and the strand bent to the required form, the ends of the strand are supported and held in place by the whole of the uncut sheet. The cutting off and bending down of each strand is entirely independent of any other operation and the maintenance of the length of the sheet is preserved by keeping the body of it entire while the strands are each being cut off and bent. It appears from the testimony of experts that the expansion of metal by stretching it does not, within moderate limits, weaken its tensile strength, though it has a tendency to make it more brittle, but not injuriously, if not carried too far. The utility of this method of expanding the metal is sufficiently proven.

Figure 1 of the drawings, reduced in size, illustrates the sheet partly expanded by the process, or method, above explained:



The claim reads as follows :—

> "I claim the herein described method of making open or reticulated metal work, which consists in simultaneously slitting and bending portions of a plate or sheet of metal in such manner as to stretch or elongate the bars connecting the slit portions and body of the sheet or plate, and then similarly slitting and bending in places alternate to the first mentioned portions, thus producing the finished expanded sheet metal of the same length as that of the original sheet or plate, substantially as described."

It seems even more simple than any method heretofore employed. It drew from the Circuit Court of Appeals for the Third Circuit the characterization of a "happy thought", and we think merited it. But that court felt constrained to reverse the decree of the lower court, which sustained the patent, because the conception of the thought was unaccompanied by any sufficient description of the means by which it might be realized, We cannot agree to this, especially in the face of the testimony on that subject in the present record.

If the specifications for a process patent do not sufficiently indicate to those skilled in the art to which it relates some means or instrumentalities by which it may be practised, and the contrivance of means for effecting it is beyond the skill of a trained mechanic, it might well be said that the inventor had not shown how to make his invention useful and therefore had not entitled himself to a patent. But here the inventor has gone on to point out that the slitting and bending is to be done by a stationary cutter under the sheet and upper cutters to co-operate in shearing the slit. These upper cutters are so constructed as to bend down the strand to the proper distance. It is not stated just what the form shall be, but only ordinary skill in mechanics would suggest that the outer side of the cutter might be beveled or a shoulder might be formed thereon to carry down the strand when severed.

Mechanism for the shifting of the sheet and of the knives was already in use in machines for expanding metal, and, indeed, was common in the mechanical arts. Moreover, experts

have here testified that these devices could be arranged by any skillful mechanic and we have no reason to doubt it.

Nor can we agree to the suggestion that the patent was for the function only of a machine. No doubt the function or principle of a machine cannot be the subject of a patent. It is not a distinct entity, but a mere property of the machine, and inseparable from it, and is developed by its normal use. But Golding was not here seeking to patent a machine, or the operation of a machine. It was a matter of indifference to him by what particular means his method could be practised, but only that certain things should be done in a certain order. The apparatus he suggests would not by any known method of use be of any value. True, he could slit and bend sheets and strands of metal with it. That was the function of it. But still, until and unless he invented a specific method of use, his apparatus was of no account. The material and the apparatus were mere *disjecta membra* until the light of more than the ordinary intelligence pointed the way to the subjection of the one to the operation of the other to a useful purpose. We think the invention may rightly and aptly be characterized as an improvement in the art of expanding sheet metal, and is within the letter and spirit of the statute. To hold otherwise, would be to adopt a rule which would operate to exclude from the benefits of the law many valuable inventions of things new and useful, and this not by resting upon any exception found in the statute, but upon an artificial graft of error alien to its spirit and purpose. Several of the decisions of the Supreme Court are cited by Mr. Justice BROWN in Risdon Locomotive Works v. Medart, 158 U. S., 68, which illustrate the difference between the function, principle or operation of a machine and the application of the function or principle in a peculiar and as yet unthought of way, and the discovery of the new mode of application of the principle conduces to a new and useful result. The cases of Mowry v. Whitney, 14 Wall., 620; Cochrane v. Deener, 94 U. S., 680, and The Telephone cases, 126 U. S., 1, are examples in point. As we understand the case of Risdon Locomotive Works v. Medart, nothing is there decided which is in conflict with these views. Three patents were there under consideration. The first one considered was for a process in making belt pulleys. The other two were for belt pulleys. The last two were disposed of upon the

ground that the pulleys were not essentially different from former constructions, but were better only in the respect that they were the product of superior workmanship; and that part of the case may, for present purposes, be laid aside. With regard to the patent for a process, the court took the view that the invention was only of the result of the mechanism therein described. The opinion of the court was thereupon summed up as follows: "The result is a pulley more perfectly balanced, more faultless in shape, stronger and more durable, perhaps, than any other before produced; but this was not because the patentee had discovered anything new in the result produced, but because the mechanism was better adapted to produce that result than anything that had been before known. As pulleys of that description had been produced before, doubtless with greater care in the manufacture of them, a pulley as perfect as his might have been made. The operation or function of such machine, however, is not patentable as a process." The vital differences between such an invention and this are that in this a new and different result is produced, a difference so great as to supplant all previous results; the mechanism by which it is produced is not new, that is, not patentably new; but the manner of its use is new, and the result is not produced simply by superior workmanship. That degree of workmanship which existed in the art had not been equal during the many years of the previous manufacture of expanded metal to the discovery of the method of producing it which Golding devised.

We are of opinion, therefore, that the patent should be sustained. The infringement of it is scarcely denied and we have no doubt on that subject. The decree will be reversed, with costs, with directions to enter a decree for the complainant for an injunction and for the profits and damages to be ascertained.

IN THE UNITED STATES CIRCUIT COURT OF APPEALS

For the Third Circuit.

E. S. Bradford, J. C. Millichamp, N. J. Schmucker, Jr. and N. J. Schmucker,
Appellants,

vs.

The Expanded Metal Company and Henry Chess, Walter Chess and Harvey B. Chess, co-partners as Chess Brothers.

Before Dallas and Gray, Circuit Judges., and McPherson, District Judge.

Dallas, Circuit Judge.

The Expanded Metal Company and Chess Brothers, the company's exclusive licensees in the state of Pennsylvania, were the complainants below, and charged the appellants with infringing letters patent No. 527,242, issued in October, 1894, for an invention made by John F. Golding and assigned to the Metal Company before the letters were actually issued. The subject of the invention, as declared in the specification, is "a new and useful improvement in the art of expanding sheet metal;" and the precise improvement which the applicant asserted that he had made was the simultaneous cutting and opening, or expanding, the metal at the cuts by stretching the severed portions. In other words, he applied for a patent upon a method of manufacture, and, as will appear from the specification, which we are about to quote, he distinctly limited the novelty of his method to the stretching of the severed portion at the time when the metal was cut and the slits were

opened. The specification refers to the prior art, and to the applicant's proposed improvement, in the following language:

"In the manufacture of what is now generally known as expanded sheet metal, it has been customary to first cut the slits in the sheet metal at short distances apart, and to open the metal at the cuts thus formed by bending the severed portions or strands in a direction at right angles substantially to the plane of the sheet. It has also been made by simultaneously cutting and opening the metal by means of cutters set off, or stepped relatively so as to make the slashes or cuts in different lines in the manner set forth in patents No. 381, 230 or No. 381,231, of April 17, 1888. In both of these methods the product is somewhat shorter and materially wider than the original sheet, but practically no stretching or elongation of the metal forming the strands is caused.

In my present invention, I seek to avail myself of the ability of the metal to stretch or distend as well as of its ability to bend under strain or pressure, and the invention consists in the improved method of making expended metal, viz.: by simultaneously cutting and opening or expanding the metal at the cuts by stretching the severed portions.

In the practice of the invention, I prefer to make a series of slits in a straight line across the edge of the sheet, and at the time of cutting the slits, and as a continuation of that operation, to depress or stretch the severed metal, *i. e.*, those portions of the sheet lying outside of the cuts, in a direction at right angles to the sheet, without any contraction for the length of the original sheet. This operation is then repeated after the sheet has been fed forward, the slits being made opposite the portions unsevered at the previous operation, and so on until the entire sheet is expanded.

My invention allows the use of a single straight under knife, which of course does not need to be shifted in changing the location of the cuts, and the upper cutters are also arranged in a straight line, but their acting

edges represent a corrugated form of alternate transverse projections and recesses adapted to coact with the under knife in cutting the slits at the proper intervals and to stretch the severed strands, and either the upper cutter or the sheet is shifted back and forth between the operations as will be understood.

In the accompanying drawings Figure 1 is a perspective of a sheet a part of which has been expanded by my invention. Fig. 2 is an elevation of the preferred form of cutters used in manufacturing it. Fig. 3 is a section on line 3-3 of Fig. 2. Fig. 4 is a plan of the sheet showing the first line of slits in dotted lines.

In the drawings, A represents the sheet from which the expanded metal is formed. B represents the series of upper or moving cutters and C is the lower knife which may be and preferably is stationary. The lower edges of the cutters B are so shaped as to form alternate transverse projections *b* and recesses or intervening openings *c*, the projecting portions being adapted to coact with the lower knife in forming the slits. They are also adapted to force or carry downward the severed portions of the metal at the same operation to the position indicated by the broken lines *m* at Fig. 2. It will be noticed that at the time the bend is imparted to the severed portion, there can be no contraction in the product from the length of the sheet A, because the ends of the severed portion or strand are still integral with the sheet and will not permit it. The sheet is then fed forward and the slitting and stretching operation is repeated. One line of slits across the sheet is formed at each operation, and the upper cutters, or the sheet, may be shifted and the sheet be fed forward between the operations so that the slits are in every case made back of the portions left unsevered at the preceding operation, or, in other words, the slits and unsevered portions alternate in position at successive operations. The bend given to the severed portion or strands as as they are usually called, is in a direction at right angles to the plane of the sheet, and as there is no contraction in the length of the metal, it necessarily

follows that the expansion is obtained from the stretch, distention or elongation of the severed strands."

In conformity with the specification, the applicant claimed:

> "The herein described method of making open or reticulated metal work, which consists in simultaneously slitting and bending portions of a plate or sheet of metal in such manner as to stretch or elongate the bars connecting the slit portions and body of the sheet or plate, and then similarly slitting and bending in places alternate to the first mentioned portions, thus producing the finished expanded sheet metal of the same length as that of the original sheet or plate, substantially as described."

The Circuit Court sustained the validity of the patent and the charge of infringement and made the usual decree for a perpetual injunction and an account. From this decree the present appeal is taken, and several questions are presented and have been ably argued by counsel, both orally and upon the printed briefs. Of these, however, we think it unnecessary to consider more than one, namely, the validity of the patent in suit. It must be conceded that the case is close, and that reasons for the decision of the Circuit Court are not lacking; but we have been obliged to come to the conclusion that the so-called invention was not really an invention at all within the meaning of the patent laws. As we regard the application, it was no more than the announcement by Golding of a happy thought, unaccompanied by any sufficient description of the means by which his thought might be realized. Indeed, it does not seem unfair to add, that the applicant himself was in such doubt about the validity of the patent in suit, by which he sought to protect the method of manufacture therein described, that he hastened to take out a patent for a machine by which the desired result could be accomplished, and obtained by letters patent No. 581,713, all the advantage over his competitors to which we think he is entitled.

When the patent in suit was applied for, it was certainly well known that a strip of a thin metal blank, partially severed by a slot from the portion adjacent thereto, could be stretched; but, in spite of this fact, the patent undertakes to obtain a monopoly of such stretching, whenever this result is accomplished by a particular method, namely, by acting upon the bars that connect the slit portions and the body of the sheet or plate, so as to stretch them at the time when the slit is made and the slit portion is bent. Whatever the manner by which this simultaneous action is brought about, the claim is broad enough to cover it, and the consequence is, as it seems to us, that the applicant is asking for a patent upon what may have been a valuable idea, but was after all no more than this. His specification and claim may be condensed into a brief announcement to the world, that it would be an improvement in the process of manufacturing expanded metal, to stretch certain portion of the metal at the time when the slit was cut and the mesh was opened. He did not explain how this was to be done, save in a rudimentary and insufficient way, until he made his application for a machine to put his idea into practice; and we repeat, therefore, that in our opinion his patent for a so-called method is obnoxious to the well known rule which is thus summarized in section 509 of Robinson on Patents:

> "Patents are not granted for abstract ideas, principles, modes of operation, functions or results of machines, but underlying every patentable invention is the idea of means.
>
> "The thing patented is the concrete expression of this idea, the mechanism by which it is reduced to practice (Burr vs. Duryee, 1 Wall, 532; O'Reilly vs. Morse, 15 How. 62). It is this which must be set forth in the claim in distinction from the discovery or conception, idea or mode of operation which it embodies."

Without extending this opinion, we think the principles laid down by the supreme court in Risdon Iron Works v. Medart, 150 U. S. 68, and the other cases, both in that court and in the lower courts, which have recognized these prin-

ciple as valid—many of them are cited on the appellant's brief—require the reversal of the decree appealed from, with instructions to the circuit court to dismiss the bill at the costs of the complainant.

It is therefore so ordered, with further instructions to the clerk of this court that the costs of the appeal are to be paid by the appellees.

FILED
NOV. 7 1906
JAMES H. McKENNEY,

No. 606.

IN THE

Supreme Court of the United States.

OCTOBER TERM, 1906.

THE GENERAL FIREPROOFING COMPANY,
Petitioner,

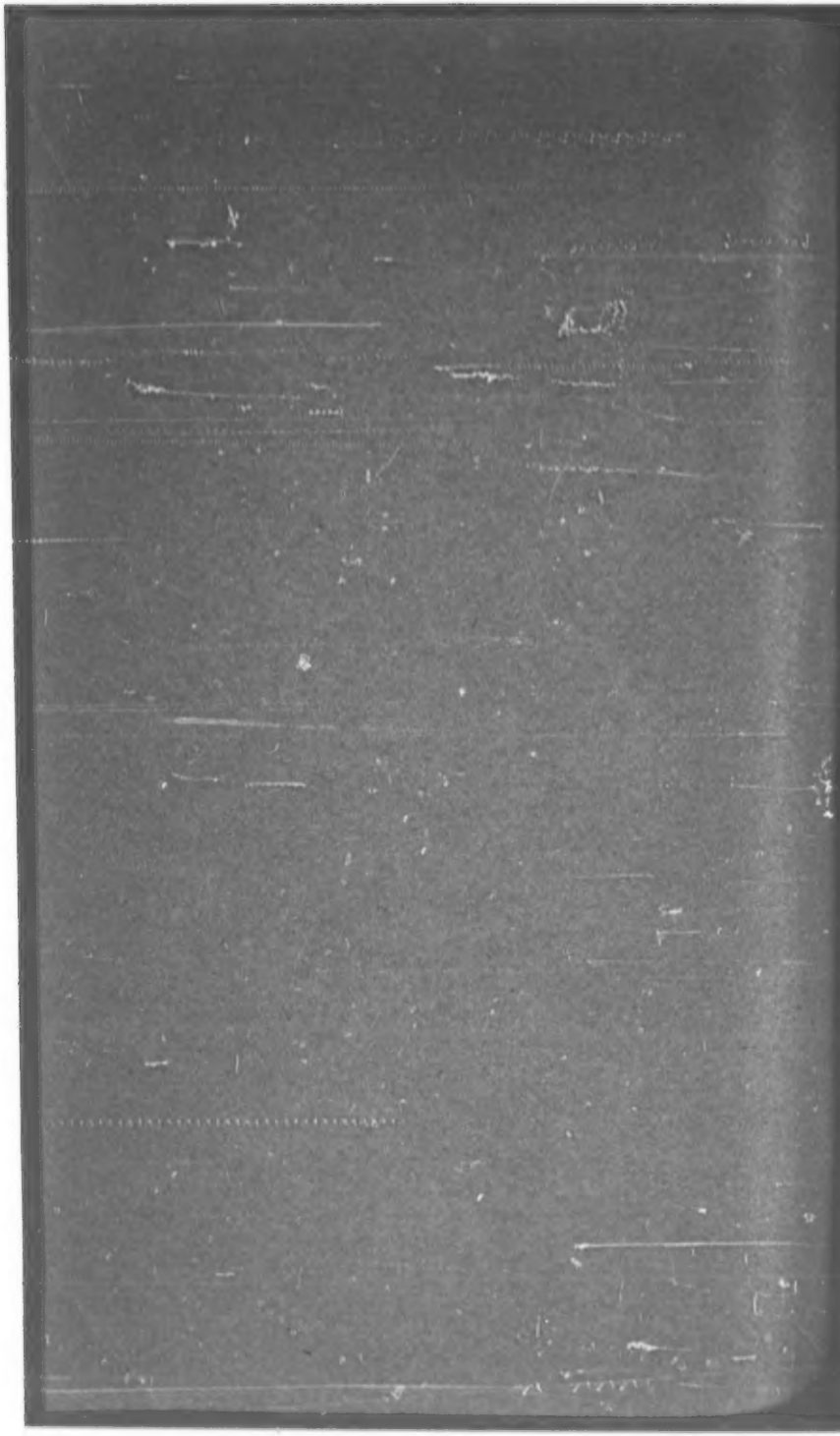
versus

THE EXPANDED METAL COMPANY,
Respondent.

Brief for Petitioner in Support of Petition for Writ of Certiorari.

THOMAS W. BAKEWELL,
GEORGE H. CHRISTY,
Solicitors and of Counsel for Petitioner.

C. G. BURGOYNE, 72 to 78 Spring Street, New York.



In the Supreme Court of the United States.

THE GENERAL FIREPROOFING COMPANY, Petitioner, vs. THE EXPANDED METAL COMPANY, Respondent.	October Term, 1908.

Brief for Petitioner in Support of Petition for Writ of Certiorari.

The petition shows that there have been two conflicting and irreconcilable decisions of Circuit Courts of Appeal with reference to the same patent, namely the patent of John F. Golding No. 527,242, dated October 9, 1894, for a Method of Making Expanded Metal. The opinions of these Courts are printed at the end of the petition. In one case, a suit brought by the respondents herein against E. S. Bradford and others, the Circuit Court of Appeals for the Third Circuit adjudged the patent in suit to be invalid, and stated (Petition, p. 24):

"we repeat, therefore, that in our opinion his patent for a so-called method is obnoxious to the well known rule which is thus summarized in section 509 of Robinson on Patents:

> "'Patents are not granted for abstract ideas, principles, modes of operation, functions or results of machines, but underlying every patentable invention is the idea of means.
>
> "'The thing patented is the concrete expression of this idea, the mechanism by which it is reduced to practice (Burr vs. Duryee, 1 Wall., 532; O'Reilly vs. Morse,

15 How., 62). It is this which must be set forth in the claim in distinction from the discovery or conception, idea or mode of operation which it embodies.'

"Without extending this opinion, we think the principles laid down by the Supreme Court in Risdon Iron Works vs. Medart, 158 U. S., 68, and the other cases, both in that court and in the lower courts, which have recognized these principles as valid—many of them are cited in the appellant's brief—require the reversal of the decree appealed from, with instructions to the circuit court to dismiss the bill at the costs of the complainant."

In the case at bar the Circuit Court of Appeals for the Sixth Circuit adjudged the same patent to be valid and said in their opinion (Petition, page 16):

"We think the invention may rightly and aptly be characterized as an improvement in the art of expanding sheet metal, and is within the letter and spirit of the statute. * * * As we understand the case of Risdon Locomotive Works vs. Medart, nothing is there decided which is in conflict with these views."

The petition therefore presents a conflict of decision between two Circuit Courts of Appeal with respect to the same patent, one court holding it to be valid and the other court holding it to be invalid, and a conflict of opinion between these courts with respect to the identical ground of defense to the patent.

In both of these cases the decrees of the Circuit Court were reversed.

We submit that the decision of the Circuit Court of Appeals for the Sixth Circuit in the case at bar is erroneous, and principally in the following respects:

1. It is in conflict with the uniform course of the decisions of the Supreme Court as to the patentability of claims for processes; and it sustains as valid a claim which under the decisions of this Court, notably in *Corning vs. Burden*, 15 Howard, 252; *Cochrane vs. Deener*, 94 U. S., 780; *Risdon Locomotive Works vs. Medart*, 158 U. S., 68; and *Busch vs. Jones*, 184 U. S., 598, should be held to be invalid because it covers a mere function or mode of operation of a machine and produces only an old and well-known product.

2. That the method set forth in the claim lacks substantial novelty as a method; that is to say, the acts or series of acts

Figure 1.

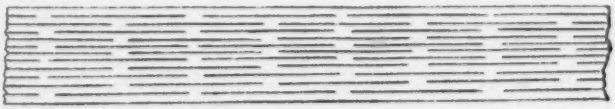


Figure 2.

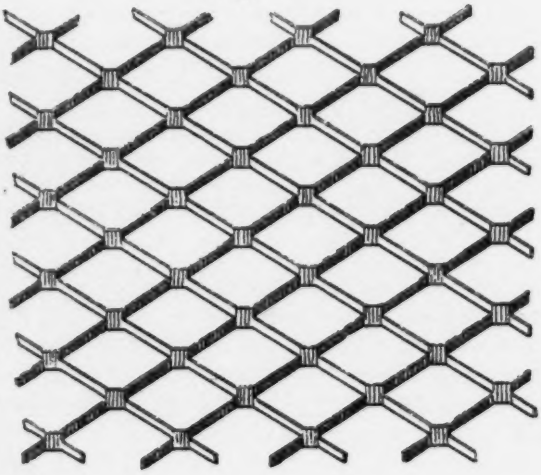
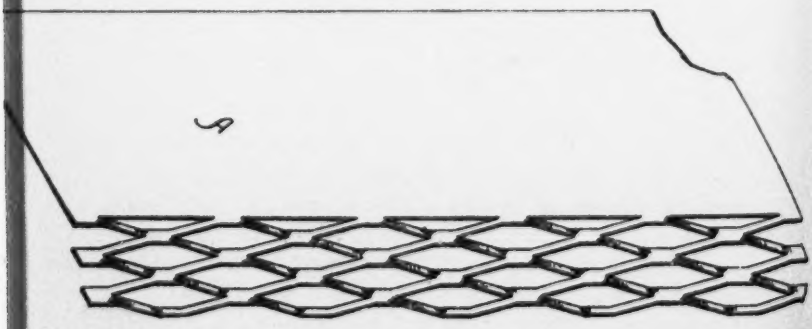


Figure 3.



set forth in the patent in suit are all old in this very art, and the patent itself declares that the product of the supposed method is likewise old.

The patent in suit (Record, p. 505) begins with a recital to the effect that the invention relates to the art of expanding sheet metal, and that expanded sheet metal was an old product which had previously been made by machines which slitted a sheet of metal at short distances apart and opened the metal at the slits by bending the severed portions or strands. The patentee purposed to make this old product, and the feature of his invention, which he believed to be new, is stated as follows on lines 29 to 33 of the specification (Record, p. 505):

"and the invention consists in the improved method of making expanded metal by simultaneously cutting and opening or expanding the metal at the cuts by stretching the severed portions."

The other steps of the method were old, for on lines 15 to 18 the patentee stated that the simultaneous cutting and opening of the metal by cutters had been previously practiced, his language being:

"It [expanded metal] has also been made by simultaneously cutting and opening the metal by means of cutters set off or stepped relatively so as to make the slashes or cuts in different lines in the manner set forth in Patents No. 381,230 or No. 381,231, of April 17, 1888."

The novelty which the specification asserts to belong to the supposed method of the patent in suit is that the patentee avails himself of the ability of the metal to stretch, and, in manufacturing the expanded metal, not only opens or expands the cut portions of the sheet, which was old, but also stretches the metal strands of which these cut portions are composed.

The record corroborates the statement of the patent in suit that the manufacture of expanded metal by slitting a metal sheet with alternate slits and opening the slitted portions was old; and this is made apparent by the accompanying drawings of which Figures 1 and 2 are taken from the prior patent of Golding No. 297,382, dated April 22, 1884, and show respectively a piece of sheet metal formed with rows of

alternate slits and the same sheet after it has been opened out or expanded, and Figure 3 is a copy of Figure 1 of the patent in suit showing a product which is identical in substance with the product of the prior patent No. 297,382 granted ten years previously.

The act of stretching upon which the patentee predicates his invention in suit was also old, and had been fully described in the patent of Ohl No. 475,700, dated May 24, 1892, and printed on page 495 of the record. This patent belongs in the same art as the patent in suit, for an important use of the complainant's material is for metal lath. The Ohl specification describes the slitting and stretching operation, and states:

"at the same time, *stretching the strip longitudinally*" (p. 1, lines 40, 41).

"*Stretching it* (the strip) *longitudinally* and shaping it as desired" (p. 1, lines 81, 82).

Like the machine of the patent in suit, the Ohl apparatus simultaneously slits and bends portions of the plate or sheet of metal in such a manner as to *stretch* or *elongate* the strands connecting the unslit portions or body of the sheet.

The drawings opposite, marked Figures 4 and 5, are taken from the patent of Ohl and represent respectively a sheet of metal whose cut portions have been opened and stretched as described by Ohl, and the cutting dies (Figure 13 of the Ohl Patent) by which the cutting and stretching are accomplished. Figure 6 is taken from Figure 3 of the patent in suit (Record, p. 504) and shows the cutting dies by which Golding slits and opens and stretches the metal.

The record shows that the simultaneous slitting and opening of a sheet by cutters to produce expanded metal was old; that the prior machines in performing these acts stretched the metal to a certain degree; and that whether the strands were stretched to the degree described in the patent in suit and in the patent of Ohl depended solely upon the kind and direction of motion of the cutters employed in the slitting and opening machines. If the cutters were arranged to operate on vertical lines as in the patent in suit and in the Ohl patent they would necessarily stretch the metal to the maximum extent, while if the cutters were arranged to move in an oblique direction as in the prior patent of Golding and Durkee No.

Figure 4.

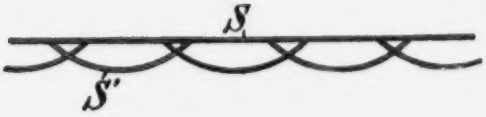


Figure 5.

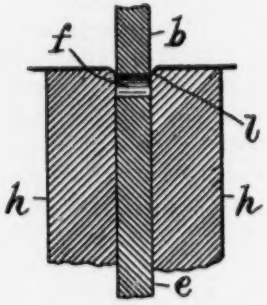
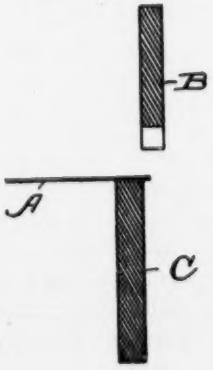


Figure 6.



381,230, dated April 17, 1888 (Record, p. 452), the product would be formed with a less degree of stretching. This is explained in the testimony of Julian Kennedy (Record, pp. 324-329). But the patent of Ohl disclosed cutters operating upon the metal in the same way as in the Golding patent in suit, to produce as great an amount of stretching.

Nor does the stretching have any useful effect upon the metal, but on the contrary, as stated in the opinion of the Circuit Court of Appeals for the Sixth Circuit, "it appears from the testimony of experts that the expansion of metal by stretching it does not, within moderate limits, weaken its tensile strength, though it has a tendency to make it more brittle, but not injuriously, if not carried too far."

From these considerations it follows that the method as such was old in every essential respect; that the stretching upon which the specification bases the novelty of the invention was old in this art, and that it is useless in itself and a mere incident to the employment of a particular kind of mechanism to cut and open the strands. The invention claimed is therefore unpatentable under the decisions of this Court, of which we cite the following:

Corning vs. Burden, 15 Howard, 251, is an illustration of the class of unpatentable processes. It was old to prepare the spongy balls of puddled iron for rolling by squeezing out the slag by tilt-hammers or by alligator-jaw squeezers which acted by percussion or compression; and what the patentee did was to accomplish *the same expressing of slag* by a rotary cam and an opposite curved and converging surface between which the puddle-ball was rolled and squeezed. The only novelty was in the machine. Aside from the novel mode of operation incident to the novel construction of the machine, the process was identical with the old mode of squeezing such balls.

We believe that the case of *Corning vs. Burden* is controlling of the case at bar, for Golding's alleged process of making expanded metal is the kind of process which was there declared by this Court to be unpatentable. The case was cited in *Risdon vs. Medart*, 158 U. S., 68, where this Court said:

"The leading case in this Court is that of *Corning vs. Burden* (56 U. S., 15 How., 252), decided at the same term with that of *O'Reilly vs. Morse*, *supra*. The patent was for a new and useful machine for rolling puddler's balls and other masses

of iron, in the manufacture of iron. Upon the trial the Court below charged the jury that the patent was for a new process, mode or method for converting puddler's balls into blooms by continuous pressure and rotation of the balls between converging surfaces. Upon appeal to this Court, however, the patent was held to be one for a machine, and in delivering the opinion of the Court, Mr. Justice GRIER stated with great clearness the difference between such processes as were patentable and such as involved merely mechanical operation :

"A process *eo nomine* is not made the subject of a patent in our act of Congress, It is included under the general term 'useful art.' An art may require one or more processes or machines in order to produce a certain result or manufacture. The term 'machine' includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result. But where the result or effect is produced by chemical action, by the operation or application of some element or power of nature, or of one substance to another, such modes, methods, or operations are called processes. * * * It is when the term 'process' is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means *which are not effected by mechanism or mechanical combinations.* But the term 'process' is often used in a more vague sense, in which it cannot be the subject of a patent Thus we say that a board is undergoing the process of being planed, grain of being ground, iron of being hammered, or rolled. Here the term is used subjectively or passively as applied to the machinery operated on, and not to the method or mode of producing that operation, which is by mechanical means, and the use of a machine, as distinguished from a process. *In this use of the term it represents the function of a machine,* or the effect produced by it on the materials subjected to the action of the machine. But it is well settled that a man *cannot have a patent for the function or abstract effect of the machine;* but only for the machine which produces it." (Italics not in original.)

The same rule was applied by this Court in *Busch vs. Jones,* 184 U. S., 598; *Cochrane vs. Deener,* 94 U. S., 780; *Westinghouse vs. Boyden Power Brake Co.,* 170 U. S., 562.

We respectfully submit that the writ of *certiorari* prayed for in the accompanying petition should be granted, and for the following reasons :

1. Because of the conflict of decision and the conflict of opinion between the two Circuit Courts of Appeal with respect to the same patent.

2. Because of the importance of the legal question presented by the record, which concerns the rules governing the patentability of claims for processes.

3. As shown in the petition, the case which was decided by the Circuit Court of Appeals for the Third Circuit is now pending in this Court on a writ of *certiorari*. The record in the present case is different from the record in that case in that it is fuller on the material points and presents testimony which should be before this Court in order that the issues may be fully considered. Moreover, as the petition shows, the issue of infringement in the two cases is different, and if the decision of this Court in the suit which was decided by the Court of Appeals for the Third Circuit should be predicated upon the failure of the complainant to show infringement of the patent therein it would not dispose of the present case.

The parties defendant in the two cases being different, and the records being different in respect of the proofs touching the validity of the patent and the question of infringement, we submit that it is proper that this case as well as the case decided by the Circuit Court of Appeals for the Third Circuit should be brought before this Honorable Court by writ of *certiorari*.

THOMAS W. BAKEWELL,
GEORGE H. CHRISTY,
for Petitioner.

[redacted]

Office Supreme Court, U.
FILED.
APR 26 1907
JAMES H. McKENNEY
Clerk

IN THE

Supreme Court of the United States.

IN EQUITY. [redacted] 66.

EXPANDED METAL COMPANY and WALTER CHESS and HARVEY B. CHESS, Co-Partners, Late Trading with HENRY CHESS, Deceased, as CHESS BROTHERS,

Petitioners,

v.

EUGENE S. BRADFORD, JOSEPH C. MILLICHAMP, NICHOLAS J. SCHMUCKER, JR., and NICHOLAS J. SCHMUCKER,

Respondents.

On Petition for Writ of Certiorari to the United States Circuit Court of Appeals for the Third Circuit.

PETITION AND MOTION.

ERNEST HOWARD HUNTER,
Counsel for the Petitioners.

International, 320 Chestnut St.

IN THE

Supreme Court of the United States.

IN EQUITY.

October Term, A. D. 1906.

EXPANDED METAL COMPANY, AND WALTER CHESS AND HARVEY B. CHESS, CO-PARTNERS, LATE TRADING WITH HENRY CHESS, DECEASED, AS CHESS BROTHERS,

Petitioners.

vs.

EUGENE S. BRADFORD, JOSEPH C. MILLICHAMP, NICHOLAS J. SCHMUCKER, JR., AND NICHOLAS J. SCHMUCKER,

Respondents.

NOTICE TO MOTION.

To Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas J. Schmucker, the above-named defendants:

Please take notice that on Monday, April 29th, 1907, at the opening of the Court on that day, or as soon thereafter as counsel can be heard, a motion for the writ of *certiorari*, of which motion a copy is annexed, will be submited to the Supreme Court of the United States at the

City of Washington, D. C., for the decision of the Court thereon.

In support of said motion a petition and brief will also be presented to the Court. A copy of the petition and of the brief are herewith served upon you.

Respectfully,

ERNEST HOWARD HUNTER,
Attorney and of Counsel for Petitioners.

Philadelphia, Pa.

Due service of the foregoing Notice of Motion, and copies of the petition and brief in the above cause are hereby admitted this 16th day of April, 1907.

E. HAYWARD FAIRBANKS,
Of Counsel for Respondent.

IN THE
SUPREME COURT OF THE UNITED STATES.

IN EQUITY.

October Term, A. D. 1906.

Expanded Metal Company, and Walter Chess and Harvey B. Chess, co-partners, late trading with Henry Chess, deceased, as Chess Brothers,

Petitioners.

vs.

Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas J. Schmucker,

Respondents.

MOTION.

And now comes the Expanded Metal Company and Walter Chess and Harvey B. Chess, co-partners, late trading with Henry Chess, deceased, as Chess Brothers, the above-named petitioners, by Ernest Howard Hunter, their attorney and counsel, and move this Honorable Court for a writ of *certiorari* directed to the Honorable the Judges of the United States Circuit Court of Appeals within and for the Third Judicial Circuit, commanding them forthwith to certify and return to this Court all proceedings by them had in the suit before them, wherein these petitioners were appellees, and said respondents, Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas J. Schmucker, were appellants.

The question involved herein arises from an infringement of Letters Patent of the United States, No. 527,242, granted and issued to the Expanded Metal Company, as

assignee of John F. Golding—in which the petitioners, Walter Chess and Harvey B. Chess, surviving partners of the firm of Chess Brothers, have an exclusive license under said patent for an undivided territory—and concerns the validity of, and interpretation to be put upon, the specification and claims of said Letters Patent; and whether or not the subject matter of said patent is patentable as an art, process or method, in view of the decision of this Honorable Court in Risdon Iron and Locomotive Works, *vs.* Medart, 158, U. S., 68.

The said patent and claims thereof have been found to be valid by the United States Circuit Court for the Eastern District of Pennsylvania and held infringed; but the United States Circuit Court of Appeals for the Third Judicial Circuit, while admitting that the "case is close, and that reasons for the decision of the Circuit Court are not lacking," has held the patent invalid as not disclosing "an invention at all within the meaning of the patent laws," and has ordered petitioners' bill of complaint dismissed, contrary to equity and to the decisions of this Honorable Court and of United States Courts in other Judicial Circuits.

EXPANDED METAL COMPANY,

By OSCAR BRADFORD,

President.

CHESS BROTHERS,

By WALTER CHESS.

ERNEST HOWARD HUNTER,

Attorney and of Counsel for Petitioners.

IN THE
SUPREME COURT OF THE UNITED STATES.

IN EQUITY.

October Term, A. D. 1906.

Expanded Metal Company, and Walter Chess and Harvey B. Chess Co-partners, late trading with Henry Chess, deceased, as Chess Brothers,

Petitioners.

vs.

Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas J. Schmucker,

Respondents.

PETITION FOR WRIT OF CERTIORARI.

To the Honorable the Chief Justice and the Associate Justices of the Supreme Court of the United States:

Your petitioners, Expanded Metal Company, and Walter Chess and Harvey B. Chess, co-partners, late trading wih Henry Chess, deceased, as Chess Brothers, respectfully show unto this Honorable Court, as follows, to wit:

1. The Expanded Metal Company, a Missouri corporation, as assignee of Letters Patent No. 527,242, for a method of making expanded sheet metal, granted October 9, 1894, on the application of its assignor, John F. Golding, and Henry Chess, *et. al.*, of Pittsburg, Pennsylvania, composing the firm of Chess Brothers, as exclusive licensees under the said patent for the States of New York, Pennsylvania, West Virginia and Ohio, filed their bill of complaint

in the Circuit Court for the Eastern District of Pennsylvania, on April 30, 1903, against Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas J. Schmucker, of Philadelphia, Pennsylvania, for an injunction, damages and accounting for the infringement of said Letters Patent.

2. The defendants answered, denying infringement, and alleging the invalidity of the patent for want of utility, lack of patentable subject matter as a method or process, and anticipation and lack of invention in view of the prior art.

The case was heard on the proofs in support of the pleadings, and on March 30, 1905, his Honor, Judge Holland, filed an opinion sustaining the bill and awarding the injunction.

3. Defendants appealed to the Circuit Court of Appeals for the Third Circuit from the decree of the Circuit Court, the assignment of error attacking its findings, (a) on the question of the validity of the patent in view of the prior state of the art, (b) on the question of patentability of the subject matter as a process or method, and (c) on the question of infringement.

On hearing, the Court of Appeals admitted that the "case is close, and that reasons for the decision of the Circuit Court are not lacking," but held that the invention was really not an invention at all within the meaning of the patent laws, basing its opinion on the principles laid down by this Honorable Court in Risdon Iron and Locomotive Works *vs.* Medart, 158, U. S., 68.

4. Petitioners, feeling that said Circuit Court of Appeals failed to do justice and equity between the parties by placing an unwarrantable construction upon the opinion of this Court in Risdon Locomotive Works *vs.* Medart (*supra*), and by improperly applying the principles of that case to the improvement described in your petitioners' said

patent, at once filed a petition for rehearing, calling attention to the actual merits of the case, but said petition was denied.

5. For the reasons hereinafter given, unless this Court shall exercise its right of review, as provided by law, not only will petitioners suffer great financial loss, but the present case will seriously affect the expanded metal trade in this country and abroad, as different companies have founded large business interests on the patentability of the process or method, and on the validity of the patent in suit and the decision of the said Circuit Court of Appeals, if allowed to stand, will establish a precedent seriously inimical to the manufacturing industries of the country generally and to the capital invested therein.

6. The question involved in this case is the patentability of arts or processes which do not reside in "chemical or elemental action," but consist rather in a series of physical steps or operations performed upon an article to change its form and character. This question is at present undetermined, and great doubt and difference of opinion exist among the Federal Judiciary and Officials of the Government as to the meaning of the several decisions of this Court in which this question has been treated, and it is of the utmost importance to the business interests of the country at large that the question should be finally determined by this Court.

7. The importance of having this question determined is apparent from the fact that the Patent Office of the United States is at present constantly issuing patents for arts or processes of this nature, similar in character to the petitioners' patent, and that such practice has been approved by the Court of Appeals of the District of Columbia, having appellate jurisdiction over the Commissisoner of Patents, said Court having in the case of *ex parte* Weston, 94

O. G., 1876, 17 App. D. C. 431, approved of such practice in the following words:

> "Numerous other cases have been cited to us "wherein the Patent Office has isssued patents for "processes of a merely mechanical character as distin- "guished from processes of elemental or other similar "action; and it seems to us that, *in the absence of any "distinct and positive utterance from the Supreme Court "of the United States* limiting patentability to pro- "cesses of the latter character, it is not improper that "the practice should be continued."

8. The unsettled condition of the law on the subject is injurious to the general business interests of the country. The grant of such patents has encouraged the investment of capital in them and the creation of important industries on the faith of their validity and of the protection afforded by them under the Patent Laws, and if such patents are in fact invalid under those laws, it is to the public interest that this Court should give a positive and distinct utterance on the subject and that the granting of such patents should cease.

9. On the other hand, if such processes are patentable under the existing law, the doubt which now exists as to their validity, and which the decision of the Circuit Court of Appeals in this case will tend greatly to increase, should be removed by the decision of this Court, as that doubt tends to create distrust and to deter the investment of capital in really meritorious inventions, thereby depriving deserving inventors of the benefits the Patent Laws were intended to afford.

10. If such processes are unpatentable because of some deficiency or defect in existing law, it is of the utmost importance that this Court should so decide, that Congress may determine whether the enactment of further laws is advisable to correct such deficiency or defect and to afford protection to this class of inventors.

11. The question of the patentability of such processes is one which concerns the uniformity of the law of patents between nations. If such processes are not patentable under the decision of this Court in *Risdon Iron and Locomotive Works* vs. *Medart*, as interpreted by the Circuit Court of Appeals for the Third Circuit in this case, the law in this country is directly in conflict with the law in the other principal manufacturing countries, where such processes are upheld, and particularly in Great Britain, where the patentability of such processes, if truly involving novelty and invention, has never been denied. This question is of particular importance in this case because of the fact that patents similar to the patent here involved are the basis of important industries in the principal manufacturing countries.

12. The question is directly presented by your petitioners' patent in this case, and probably no better patent could be selected to fairly present the question for determination. The patent relates to the art or "Method of Making Expanded Sheet Metal"—that is, an open or reticulated sheet produced by enlarging a solid sheet of metal into a greater area than the original blank, and the method or art covered by the claim consists of certain operations performed successively in a certain relation to previous operations, whereby the successive steps, when so performed, co-act or combine together in the production of an improved result, said claim being in the following words:

> "The herein described method of making open or "reticulated metal work, which consists in simultane-"ously slitting and bending portions of a plate or sheet "of metal in such manner as to stretch or elongate the "bars connecting the slit portions and body of the sheet, "and then similarly slitting and bending in places alter-"nate to the first mentioned portions, thus producing "the finished expanded sheet metal of the same length "as that of the original sheet or plate, substantially as "described."

The words of this claim were those selected by the Patent Office Examiner for the purpose of properly defining the patentee's invention.

13. The principal defense offered by the defendants and urged at the argument, both in the Circuit Court and in the Circuit Court of Appeals, was that the patent was invalid because the claim above quoted was for a series of *mechanical steps* or acts and did not involve *chemical or elemental action* and that such improvments, though new and useful, were not patentable as processes under the opinion of this Court in *Risdon Iron and Locomotive Works* vs.*Medart,* 158, U. S., 68. The Circuit Court held such process patentable on the authority of the decisions of this Court in Cochrane *vs.* Deener, 94, U. S., 780, and *Tilghman* vs. *Proctor,* 102, U. S., 707; the Circuit Court of Appeals for the Third Circuit in reversing the Circuit Court expressly bases its decision on "the principles laid down by the Supreme Court in Risdon Iron Works *vs.* Medart," and holds the so-called invention *was not really an invention at all within the meaning of the patent laws."* This decision of the Circuit Court of Appeals arose from a misunderstanding of the invention or improvement described in the claim of the patent and a misconstruction of the principles of Risdon *vs.* Medart, or a misapplication of those principles to the claim of the patent, and, if allowed to stand, will establish a precedent, that, under the decision of this Court in the said case of Risdon Iron and Locomotive Works *vs.* Medart, processes or methods, such as that described in and covered by the claim of this patent, are not patentable as inventions under the existing law.

14. The effect of such an interpretation of the law will be to deprive a certain class of inventors of the right of protection by letters patent. Inventors of meritorious processes or methods which do not involve chemical action or a force of nature, and which cannot be sufficiently pro-

tected by a patent for a "manufacture" or a "machine" (as in the case of the invention here involved) will be debarred from the privileges extended to them by the Constitution of the United States (Art. 1, c. 8), and the Acts of Congress passed in pursuance thereof, if such inventions cannot be protected as to "arts" or processes.

15. The improvement in the art of making expanded sheet metal described in the patent involved in this case is manifestly as "invention," in the sense that it was the result of the *inventive* faculties as distinguished from the merely *imitative* faculties.

This is evidenced:

(a) By the fact that, although expanded sheet metal was known as an article, the methods or processes of its production remained for many years in a very imperfect and unsatisfactory state, and although many persons skilled in the art, including the patentee Golding, had been working for over twenty years on the art, the manufacture of expanded sheet metal did not become a commercial success until the invention of the new process or method of producing it described in the patent in suit. The evidence shows that this condition existed not only in this country, but also in England and Germany, in both of which countries the art of making expanded metal is now practiced successfully under Golding's patents, similar in character to the patent involved in this case.

(b) By the fact that the improvement in the art or method of making the metal overcame all of the existing difficulties in prior methods, which had prevented the successful making of the metal commercially, either in this country or abroad. "Expanded metal," as a commercial product capable of use in the industrial arts, was the invention of the patentee, Golding, but under the prior method practiced by him it failed of commercial success because of the inherent defects in the method of production. The

metal was irregular in form, necessarily light, of unequal strength, could be applied to limited uses only, and the sheet, when expanded, was reduced in length—to the extent of 15 to 20 per cent. By the new process all of these difficulties were overcome.

(c) By the commercial success of the new method both in this country and abroad. Prior to the invention of the new process the art was not commercially successful either here or abroad—where it had been introduced by Mr. Golding under his earlier patents. After the adoption of the new process the art immediately became commercially successful and is now practiced in, Great Britain, France, Germany, Belgium, Austria, Spain, Russia and Canada. The British Company supplies the market in Africa, India, Egypt, South America and Australia. There are now in this country as many as twenty machines employed for producing the metal and approximately 20,000 tons of the metal is now produced here annually by this process. Under the new process of the patent in suit the art has been brought from failure to one of great commercial success These results are due solely to the new method or improvement in the art of making the metal described in the patent in suit.

16. The question of the validity of this patent is not only of importance to manufacturers, architects and builders in this country, but concerns foreign interests also. This art or process is protected by substantially similar patents in the various countries where it is now being practiced, to wit: Great Britain, France, Germany, Belgium, Austria, Spain, Russia, and Canada, and the question of the validity of these patents under the laws of this or any of these countries involves international interests. If the patentability of the invention cannot be sustained in this country, in which the inventor is domiciled, such adverse action will jeopardize the validity of the similar patents in other coun-

tries and may affect the trade between nations, in view of the commercial importance of the material, and the right to produce it by the only known successful method.

Wherefore your petitioners respectfully pray that a writ of *certiorari* may be issued out of and under the seal of this Honorable Court, directed to the United States Circuit Court of Appeals for the Third Circuit, commanding the said Court to certify and send to this Honorable Court, on a date certain, to be therein designated, a full and complete transcript of the record and of all proceedings of the said Court of Appeals in the said cause therein entitled Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas P. Schmucker, defendants-appellants *vs.* The Expanded Metal Company, and Walter Chess and Harvey B. Chess, co-partners, late trading with Henry Chess, deceased, as Chess Brothers, complainants-appellees, in equity, to the end that the case may be reviewed and determined by this Honorable Court as provided in Section 6 of the Act of Congress, entitled "An act to establish Circuit Courts of Appeals, and to define and regulate in certain cases the jurisdiction of the courts of the United States, and for other purposes," approved March 3, 1891, and that your petitioners may have such other and further relief in the premises as to this Court may seem appropriate, and as the nature and circumstances of the case may require, and that the said judgment of the Circuit Court of Appeals for the Third Circuit in said cause and every part thereof may be reversed by this Honorable Court.

And your petitioners will ever pray, etc.

THE EXPANDED METAL COMPANY.

By OSCAR BRADFORD,

President.

CHESS BROTHERS,

By WALTER CHESS.

UNITED STATES OF AMERICA,
EASTERN DISTRICT OF PENNSYLVANIA, } *ss:*
COUNTY OF PHILADELPHIA.

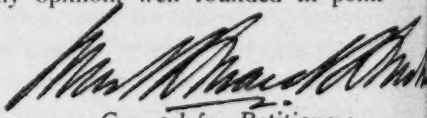
Walter Chess, one of the above-named petitioners, being duy sworn upon oath, says that he has read the foregoing petition subscribed by him and knows the contents thereof, and that the same is true in substance and matter of fact, as he verily believes.

WALTER CHESS.

Sworn to and subscribed before me this 15th day of April, 1907.

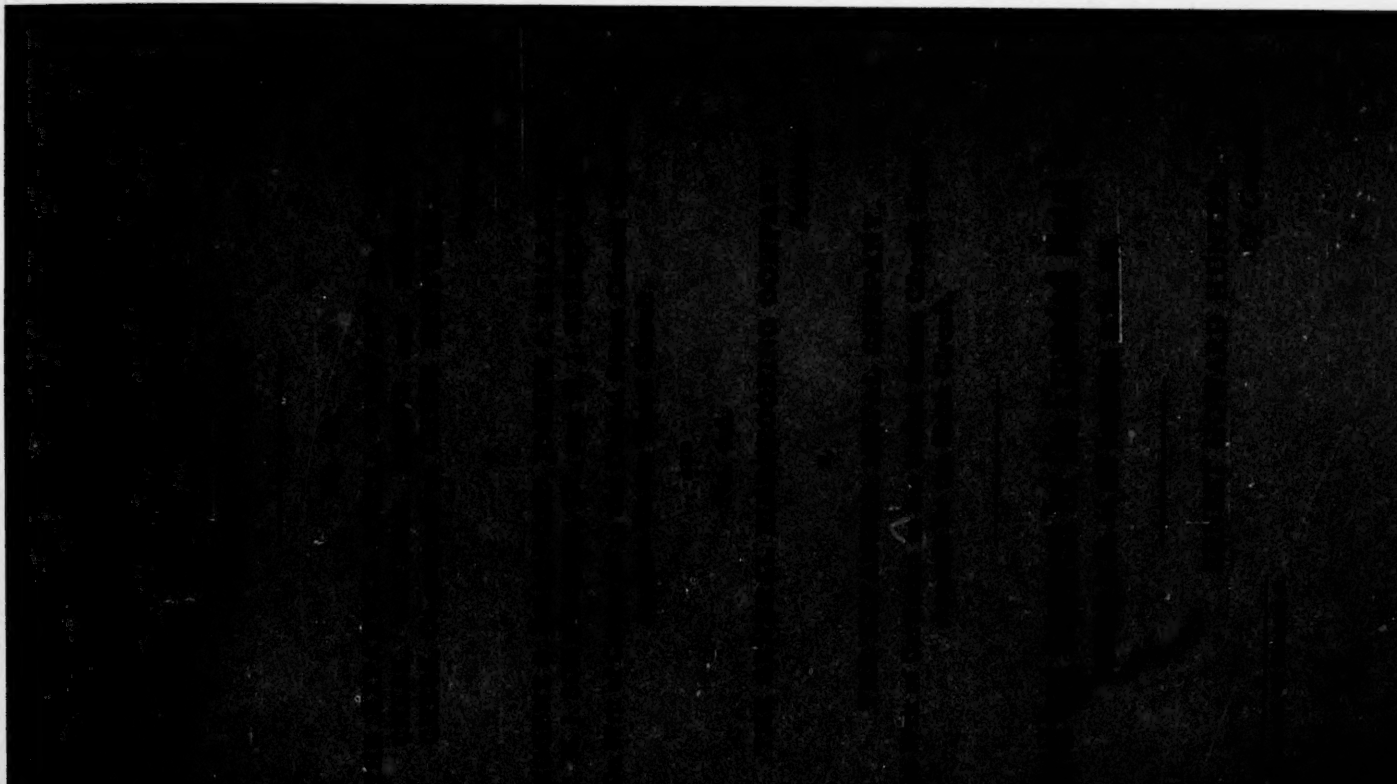
R. M. KELLY,
(Seal) *Notary Public.*

I hereby certify that the foregoing stated grounds in support of the petition for writ of *certiorari* in the above entitled cause are, in my opinion, well founded in point of law.



Counsel for Petitioners.





IN THE

Supreme Court of the United States.

October Term, 1908. No. 66.

THE EXPANDED METAL COMPANY AND HENRY CHESS, WALTER CHESS AND HARVEY B. CHESS, CO-PARTNERS AS CHESS BROTHERS,

Petitioners,

v.

EUGENE S. BRADFORD, JOSEPH C. MILLICHAMP, N. J. SCHMUCKER, JR., AND N. J. SCHMUCKER.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE THIRD CIRCUIT.

AND

October Term, 1908. No. 606.

THE GENERAL FIREPROOFING COMPANY,

Petitioner,

v.

THE EXPANDED METAL COMPANY.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE SIXTH CIRCUIT.

BRIEF AND ARGUMENT FOR THE EXPANDED METAL COMPANY, PETITIONER IN NO. 66 AND RESPONDENT IN NO. 606.

Petitioner in No. 66 and Respondent in No. 606.

THE QUESTION INVOLVED.

The question involved in these cases is that of the patentability of processes which consist of mechanical steps or operations only.

Specifically the question is whether the improvement in the Art or Method of Making Expanded Sheet Metal described and claimed in Golding's patent 527,242, dated October 9, 1894, is a new and useful invention, and susceptible as such of protection under the patent laws.

This claim is as follows:

> "The herein described method of making open "or reticulated metal work, which consists in "simultaneously slitting and bending portions of a "plate or sheet of metal in such manner as to "stretch or elongate the bars connecting the slit "portions and body of the sheet or plate, and then "similarly slitting and bending in places alternate "to the first mentioned portions, thus producing "the finished expanded sheet metal of the same "length as that of the original sheet or plate, sub"stantially as described."

We contend:

(a) That "expanded sheet metal", or, as it is more commonly known, "expanded metal", was first suggested, as a possibility, by Long in British provisional patent 2125, of 1862, by Golding (Complainant's patentee) in the U. S. patents 297,382, April 22, 1884, and 320,240, June 16, 1885, and by Johnson, in British patent 11,332, of 1885, dated September 22, 1885.

(b) That these patents disclose merely the crude idea of the possibility and desirability of such material as a commercial article, and that the method of production, which they disclose, was one which was commercially impracticable, and that such metal was never practically or commercially produced according to it.

(c) That "expanded metal", as a commercial product, capable of use in the industrial arts, was originated by the complainant's patentee, Golding, and one Durkee, under the process described in letters patent 320,242, dated June 16, 1885.

(d) That "expended metal", was then first commercially and practically produced and became known as "expanded metal" (said name having been originated and given to the material by Golding and his associates), and became extensively used and recognized as a new commercial article.

(e) That the metal, as produced under the method described in the Golding and Durkee patent 320,242, although commercially successful to some extent was of a character which limited and restricted its uses by reason of the inherent defects of the process by which it was produced. The metal was: (a) limited in thickness and strength; (b) materially shortened in length, to an extent equal to 15 to 20 per cent.; (c) lacking in strength, beyond its limitation in thickness, because the meshes could not be made at right angles to one another, which is necessary to afford the greatest strength; (d) of unequal strength throughout, because of the impossibility of forming strands of even width; (e) irregular in form. So great were these defects that some of the companies, both here and abroad, where Golding had introduced his method, failed to achieve commercial success.

(f) These conditions existed for a period of about ten years before the improvement in the art described in the patent in suit. This improvement was a radical departure from the former method employed by the patentee. By it the deficiencies and limitations of "expanded metal" were entirely removed, and the character of the metal was so greatly improved that its adaptability and availability for commercial use were greatly extended.

(g) The new process described in the patent in suit, has revolutionized the art of expanding sheet metal, and has resulted in such metal being widely and generally adopted for industrial purposes throughout the world.

HISTORY OF THE CASES.

The Expanded Metal Company, a Missouri corporation, as the assignee of letters patent No. 527,242, for a method of making expanded metal, granted October 9, 1894, on the application of the inventor, John F. Golding, and Henry Chess, Walter Chess and Harvey B. Chess, of Pittsburg, composing the firm of Chess Brothers, as exclusive licensees for the States of New York, Pennsylvania, West Virginia and Ohio, filed their bill of complaint in the Circuit Court for the Eastern District of Pennsylvania on April 30, 1903, against Eugene S. Bradford, Joseph C. Millichamp, Nicholas J. Schmucker, Jr., and Nicholas J. Schmucker, all of Philadelphia, for an injunction, damages and accounting on account of the infringement of said patent.

The defendants answered, denying infringement and alleging the invalidity of the patent for want of utility, lack of patentable subject matter as a method or process, and anticipation and lack of invention in view of the prior art.

The case was heard on pleadings and proofs by Judge Holland, who, on March 30, 1905, filed an opinion sustaining the bill (Bradford Rec. 204; 136 Fed. Rep. 870).

On appeal the Circuit Court of Appeals for the Third Circuit, in an opinion by Dallas, C. J., reversed the decree of the Circuit Court and found the patent invalid (Bradford Rec. p. 220; 146 Fed. Rep. 984).

On April 25, 1907, the complainant filed its petition in this Court for a writ of *certiorari* to the Circuit

Court of Appeals for the Third Circuit to review this decision. That petition was granted, and the writ issued May 15, 1907.

The Expanded Metal Company also filed its bill for infringement against The General Fireproofing Company in the Circuit Court of the United States for the Northern District of Ohio.

The defendant answered denying infringement and alleging the invalidity of the patent on substantially the same grounds as were alleged in the Bradford case. This case was heard on pleadings and proofs by Judge Tayler, who, on August 6, 1907, filed an opinion, in which, following the decision of the Circuit Court of Appeals for the Third Circuit in the Bradford case, he held the patent invalid (General Fireproofing Rec. p. 255, 157 Fed. Rep. 564).

On appeal the Circuit Court of Appeals for the Sixth Circuit, in an opinion delivered by Severens, C. J., and filed October 16, 1908, reversed the Circuit Court and held the patent valid and infringed (General Fireproofing Rec. p. 448, 164 Fed. Rep. 849).

On November 9, 1908, the defendant filed its petition in this Court for a writ of *certiorari* to the Court of Appeals for the Sixth Circuit to review that decision. That petition was granted November 16, 1908.

Judge Holland in the Circuit Court for the Eastern District of Pennsylvania, in the Bradford case, held the method patentable and the claim valid.

The Circuit Court of Appeals for the Third Circuit reversed that decision.

Judge Tayler in the Circuit Court for the Northern District of Ohio, in the General Fireproofing case, following the decision of the Circuit Court of Appeals for the Third Circuit, held the method unpatentable and the claim invalid.

The Circuit Court of Appeals for the Sixth Circuit reversed that decision.

The claim of the patent presents the question of the patentability of that class of processes, methods or arts which consist of mechanical acts or operations as distinguished from chemical changes and elemental actions.

The Court of Appeals for the Third Circuit, in the Bradford case, has admitted the novelty and utility of the patented process, but has excluded it from the protection of the patent laws solely on the ground that the "so-called invention was not really an invention within the meaning of the patent laws," and has based its decision principally on the opinion of this Court in *Ridson Iron & Locomotive Works* v. *Medart,* 158 U. S. 68.

The Court of Appeals for the Sixth Circuit in the General Fireproofing case has held that the principles of *Risdon Iron and Locomotive Works* v. *Medart* do not apply to the claim of the patent in suit, that there is nothing decided in that case which conflicts with the views of the Court upon the patentability of the method claimed, and that

> "to hold otherwise would be to adopt a rule which "would operate to exclude from the benefits of "the law many valuable inventions of things new "and useful, and this, not by resting upon any ex- "ception found in the statute, but upon an artifi- "cial graft of error alien to its spirit and pur- "pose."

The conflict between these opinions shows very clearly the confusion that exists in the inferior courts as to the law intended to be laid down by this Court on this subject, and emphasizes the necessity of a clear decision on the point by this Court. The conflict is not due to a difference in the application, to the particular case, of the principles of *Risdon Iron and Locomotive Works* v. *Medart*, but to a different understanding of the principles intended to be established by that

ase. By some courts it is held that under that decision no invention, however meritorious, new and useful it may be, can be patented, if it consists of mechanical operations or acts only, and does not involve some chemical changes or "elemental action"; and as we understand it, it was on this theory that this patent was declared invalid by the Circuit Court of Appeals for the Third Circuit. Other courts have taken a different view and have sustained many patents which otherwise must have been held invalid.

The importance of this question and the necessity of an authoritative decision by this Court are very great.

The Patent Office is at present constantly issuing patents for arts or processes of this nature, similar in character to the patent in suit, and such practice has been approved by the Court of Appeals of the District of Columbia, having appellate jurisdiction over the Commissioner of Patents. *Exparte* Weston 17 App. D. C. 431; 94 O. G. 1876.

The unsettled condition of the law is injurious to the general business interests of the country. The grant of such patents has encouraged the investment of capital in them and the establishment of important industries on the faith of their validity, and if such patents are in fact invalid under the law, it is to the public interest that they should no longer be granted.

On the other hand, if such patents are valid, the doubt which now exists as to their validity should be removed, as such doubt tends to create distrust and to deter the investment of capital in really meritorious inventions.

If such processes are unpatentable because of some deficiency or defect in existing statutes, it is of importance that this Court should so decide, that Congress may determine whether the enactment of further

importance that this Court should so decide that Congress afford protection to this class of inventors.

The question also concerns the uniformity of the law of patents between this country and other nations. If such processes are not patentable under the laws of this country, there is a conflict with the laws of the other principal manufacturing countries, in which the patentability of such processes is not questioned.

We believe that this question is fairly presented by the patent in this case. The claim is to a method of making "expanded metal", which consists of a combination of mechanical steps which produce a new or improved unitary result by their combined action.

Before it is possible to consider intelligently the patent and whether the improvement described therein is a patentable invention within "the meaning of the patent laws", it will be necessary to consider the art to which the alleged invention relates.

For convenience we shall refer to the record in the Bradford case (No. 66) as "B. p—.", and to that in the General Fireproofing case (No. 606) as "G. F. P. p—".

THE PRIOR STATE OF THE ART.

The Nature and Origin of Expanded Metal.

"Expanded Metal", as the name indicates, is metal which has been expanded or enlarged in area. "To expand" means, primarily, "to spread or stretch out" (Cent. Dic. Tit. "Expand"), and so "expanded metal" means, metal which has been "spread or stretched out" into an enlarged area. This spreading or stretching out is accomplished by making cuts in a sheet of metal and opening out the cut portions to form open spaces, whereby the sheet is spread, stretched out, or expanded, to an increased area, equal, at least, to that of the spaces formed by the openings.

It has been defined (Coombs XQ. 73, B. p. 153) as:

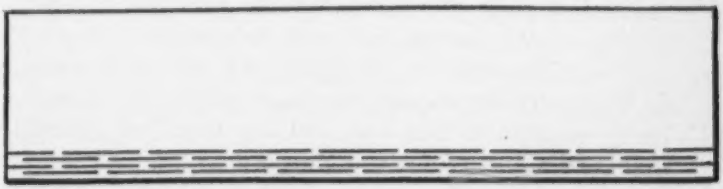
"A unitary reticulated or open meshed sheet formed by expanding a sheet of metal into a greater area than that of the original blank."

In general appearance it is somewhat similar to woven wire, but it differs from all woven wire in that it consists of a single unitary piece of metal, and the strands about the openings are not formed of separate wires or strips crossed one upon the other, but are joined by integral uncut connecting portions.

It may be formed by making a series of parallel rows of cuts or slits in a sheet of metal, the cuts in each row being out of line with those in the adjacent rows, and opening out or bending the metal at the cuts, thus expanding, stretching out, spreading, or enlarging the sheet into a reticulated or open meshed form.

In a loose way, this may be illustrated by making a row of separate cuts with a pen knife along the edge of a sheet of paper, then making a second row of cuts parallel to the first row, but with the separate cuts in the second row extending between the uncut portions in the first row, and then, in a similar manner making a third row of cuts parallel to the second line, with the separate cuts in said third row extending between the uncut poritons of the second row, as is illustrated in the following Fig. [Note that the cuts in alternate rows must extend to the outer edge of the paper.]

It will be apparent that if the outer edge of the



paper is pulled outward, the cut portion will become expanded or opened out, forming a series of "meshes"

or open spaces bounded by the cut portions. This portion of the paper is therefore widened or "expanded", and this, in a general way, is what is meant by expanded metal—in fact this was the original crude suggestion, referred to (a) p. 2 *ante,* and pp. 11-13 *post.*

The uses of expanded metal are various. Not only is it adapted to practically all uses to which woven wire may be put, but, by reason of its greater strength—owing to the fact that it consists of a single unitary sheet with integrally united strands instead of separate crossed wires—it has been put to uses to which woven wire, of the same mesh, or size of opening, and of the same weight or thickness, would not be adapted. It is in fact one of the most valuable contributions to modern industry. It is used very largely for metallic lathing, such as is now commonly employed on account of its fire-proof qualities, for the support of plastering in the construction of walls, in place of the dangerous wooden lathing; it is also used as fencing, and metallic screening for windows and skylights; for open work partitions in banks and office buildings; and for the side walls and partitions of metallic clothes lockers. But the most important and valuable use of expanded metal is as the tensile member in the construction of fire-proof arches, bridges and ceilings of concrete. During recent years the construction of arches and ceilings of concrete has been greatly developed, owing to the discovery that, by the embedment of a metallic frame in a body of concrete between the beams or supports, a very strong, light and economical fire-proof construction could be obtained; and expanded metal, in its finally developed and improved form, is especially adapted to this use, and has been very widely and generally used for this purpose.

Complainant's patentee, John F. Golding, was the originator of expanded metal in this country. He first

described it in his Patent No. 297,382, dated April 22, 1884 (B. 64).

In Fig. 1 of that patent is shown the sheet metal blank after it is cut and before it is opened out or expanded, and in Fig. 2 is shown the final expanded sheet. The method of making is thus described:

> "In the manufacture of my slashed metallic "screening, I take a blank piece of sheet metal of "the required size and thickness, and at intervals, "I slash or cut it as shown in Fig. 1, the slashes "or cuts in each line being opposite to the spaces "between the slashes or cuts of the adjoining line "or lines. These slashes or cuts are made of the "required lengths to form the proper sized meshes. "After the metallic sheet is cut or slashed, as "above described, it is stretched in a line trans- "versely to the length of the slashes or cuts, thus "forming meshes as shown in Fig. 2. The act of "stretching causes the metal forming the boun- "daries of each mesh to take an oblique position, "amounting nearly to a perpendicular line, thus "presenting the cut edges of the metal to the sur- "face of the screening. Between the ends of the "slashes or cuts are spaces of metal uncut which "hold the strands of meshes together. The size "of the mesh depends upon the length of the slash "or cut; the longer the cut the coarser the mesh, "and the shorter the cut the finer the mesh."

Under the method of making expanded metal disclosed in this patent there were two successive and independent steps; the sheet was first "slashed" or cut in the manner described, and it was then opened up or expanded by pulling it in the direction of the plane of the sheet and transversely to the length of the cuts.

While Golding was undoubtedly the originator of expanded metal in this country, and was granted this 1884 patent, it appears that the same crude idea had been previously disclosed in a British provisional speci-

fication filed by one Long in the British Patent Office in July, 1862 (B. 187).

The manner of making described in this provisional specification is substantially the same as that of Golding's 1884 patent. Long's description is as follows:

> "This invention relates to an improved manu-
> "facture of open metal work or metal trellis or
> "lattice work, intended to be used as an economical
> "substitute for ordinary wire netting or perfor-
> "ated metal, and applicable also to the manufac-
> "ture of bird cages, basket stands and supports
> "for flowers, fire guards and other purposes where
> "wire work has hitherto been employed. Accord-
> "ing to this invention, it is proposed to make
> "open metal or trellis or lattice work by making
> "a number of slits in a flat sheet of metal, such
> "slits being made in straight or curved lines or
> "rows, the slits in each line or row being made to
> "break joint with the adjoining lines or rows; a
> "small portion of the metal being left intact, or
> "uncut between the ends of the several slits. The
> "sheet, having been thus slit, is now stretched out
> "so as to open the slits, whereupon a perfectly
> "formed trellis, having hexagonal openings, will
> "be produced."

The same manner of making is also described in the British patent to Johnson No. 11,332 of 1885 (B. 189, 192):

> "According to this invention a metal sheet is
> "taken and at intervals rows or circles of slits or
> "slots are formed, the slits or slots of each row
> " 'breaking bond' with those of the adjacent row
> "or rows. The plate is then pulled in a direction
> "or directions transversely to the length of the
> "slits or slots and over a suitable frame or mould
> "if desired and there is thus produced an open
> "metal work suited to the purposes to which ordi-
> "nary lattice work or woven or interlaced metal
> "strips or wires are usually applied.
> * * * * * * *

"A sheet *a* of any suitable material or alloy "capable of being rolled, such, for example, as iron "steel, brass, or the like, and of the required thick- "ness, is taken and placed in a suitable machine "or operated upon by a cutting or stamping in- "strument to produce therein parallel rows of "slits or slots as shown at *b* in Figure 1 in such "a manner that the full parts *c* of one row or "range of slits are opposite to the slitted parts *b* "of adjacent row or rows as shown in Figure 1.

* * * * * * *

"The sheet *a* thus slitted or slotted is then "pulled or stretched in the direction of the arrows "*d d;* that is to say, transversely to the direction "of the slits."

These three patents describe the first crude form of "expanded metal", although it was not, at the time, known by this name.

By this method of manufacture the sheet is first cut, and then, by a second operation, it is pulled open or expanded, in the plane of the sheet, and may be readily illustrated by similarly cutting a sheet of paper and then opening the cuts by pulling the two sides of the paper outward. (See p. 9 *ante.*) While this method of making the metal results in the expansion or enlargement of the area of the sheet, it will be noted that it also results in a material shortening, since it is obvious that the sheet must shorten in proportion to the size of the meshes. The opening of the sheet results in the bending of the strands of the metal formed by the cuts, and this bending obviously draws nearer together the ends of the strands, and consequently the sheet must be shortened to the extent that these points are drawn together.

This result may be observed on stretching open the piece of paper above referred to.

On December 13, 1883, Mr. Golding also applied for a patent for a process of making expanded metal,

which resulted in the granting of Patent No. 320,240, dated June 16, 1885 (B. 66). The method described in this patent differs from that of Golding's 1884 patent and the Long 1862 Provisional Specification and Johnson's 1885 British patent in the particular that the expansion of the metal is effected by bending the strands transversely to the plane of the sheet, instead of by pulling upon the sheet in the direction of its own plane. It may be shown with the cut sheet of paper by bending down each strand.

This modification of Patent No. 320,240 is described as follows:

> "I take a piece of metal and make a series "of rows of incisions through it, and between the "ends of these incisions I leave uncut spaces, these "incisions or cuts being so arranged that the uncut "spaces will be at or about midway of the adjoin- "ing cuts, and thus the incisions or cuts and the "uncut spaces are made to alternate throughout "the sheet, the uncut spaces connecting the strands "one with another, and the whole remaining in one "piece, as is shown in Fig. 1. The metal thus pre- "pared is opened at the slits by causing the cut "edges to be passed by each other all in the same "direction and away from the original plane of the "metal a sufficient distance to produce the desired "size of mesh, the ends of each strand being bent "in opposite directions at or near the uncut spaces "sufficient to set the metal and maintain the mesh, "as is shown in Fig. 2. The metal is expanded "so that the strands and uncut spaces have their "greatest movement in the direction of or near a "right angle to the original plane of the metal, "and a less movement of the ends toward the cen- "ter, the strands and uncut spaces having a base "in the aggregate equal in width but shorter than "the piece from which they are cut."

In this method, as in the other, described in the Golding 1884 patent, the Long Provisional Specification, and the Johnson 1885 British patent, there were

two separate and independent operations. The sheet is first cut and the strands are then opened out or bent, and the resulting sheet, while enlarged or expanded in width, is very materially shortened in length. It will be noted that this shortening of the sheet is particularly referred to in the Golding 1885 patent No. 320,240 (l. 39, B. 67).

While these four patents undoubtedly disclosed the primary idea of a "unitary reticulated or open meshed sheet, formed by expanding a sheet of metal into a greater area than the original blank", the disclosure was crude and imperfect, and the methods described were wholly impracticable from a commercial standpoint. The public were given a knowledge of the thing desired, but not of a way to successfully produce it, and if the art had not been further developed, "expanded metal" would never have become an industrial possibility.

There can be no doubt as to the inadequacy of the methods described in these patents.

The production of expanded metal, according to them requires two separate and independent steps, first the slitting or cutting of the sheet, and secondly, the pulling out, bending, or opening of the slits. It is practically impossible to apply uniform tension throughout such a sheet, when pulled laterally at the edges; the stress will be greatest at the edges and will diminish toward the center; consequently, the openings will be irregular. Besides, such an act of pulling the sheet open distorts the form of the meshes because of the irregular temper and varying thickness in different parts of the sheet.

At this stage of the art, there had been disclosed merely the crude idea of slitting and expanding a sheet of metal by opening the strands, either by pulling the edges of the sheet laterally, in the plane of the sheet, as in Golding's 1884 patent, and the Long and Johnson

British patents, or by bending the strands transversely, as in Golding's 1885 patent 320,240. Neither of these methods was commercially practical, and expanded metal, as a commercial product, had no existence at this stage of the art. It was not known under that name.

In Long's 1862 British provisional specification, the article is described as:

> "Open metal work or metal trellis or lattice "work."

In Johnson's 1885 British patent it is called:

> "Open metal work for use as trellis work, lat- "tice work, sieving or other purposes."

In the early Golding patents it is called "slashed metallic screening."

The term "expanded metal" was originated by Mr. Golding and his associates at a later period, after they had succeeded in making a commercial product, and this metal has since been known by this name throughout the world.

"Expanded Sheet Metal," or as it is more commonly known, "Expanded Metal," as a commercial or practical product capable of use in the Industrial Arts, was originated and created by the complainant's patentee, John F. Golding, and one George B. Durkee, under the process described in Letters Patent 320,242, dated June 16, 1885.

It has been pointed out that in the first suggestions for making expanded metal, the product was obtained by two wholly independent and separate steps. The metal was first cut throughout, and then, by a second and independent operation, the cuts were opened out or expanded. It was the difficulty of successfully performing the latter operation that rendered the production of expanded sheet metal commercially impracti-

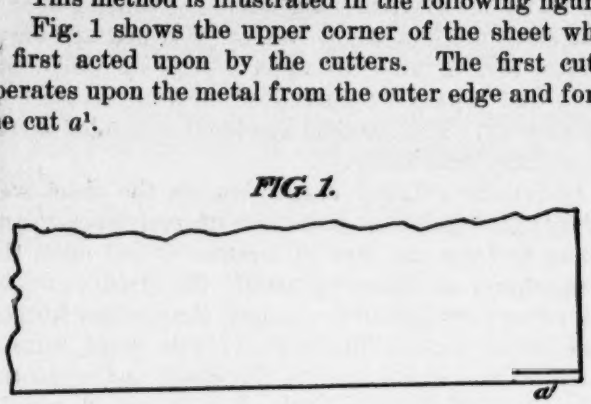
cable under the original suggestions. Realizing that a commercial product could not be obtained by these methods, Mr. Golding hit upon a plan by which the cutting and expanding operations were performed simultaneously. This method rendered expanded metal a commercial possibility.

Under the original suggestion, as the sheet was entirely cut throughout there was no resistance to the opening to form one row of meshes, pulled upon the the resistance of the metal itself; the sheet could be "spread or stretched out" to open the meshes formed by the cuts, because the rows of cuts were formed throughout the entire area of the sheet, and when the edges were pulled, the strands of each row of cuts, in opening to form one row of meshes pulled upon the strands of the next row of cuts. All of the strands formed by the cuts were opened together, and all of the meshes were simultaneously formed. But to accomplish this two independent and separate operations were required; first the cutting of the entire sheet; and, second the opening of the cuts; and, because the sheet thus cut could not be stretched uniformly throughout, a commercial product could not be obtained.

Mr. Golding's second idea was to simultaneously cut and open the sheet. But realizing that one row of cuts could not be opened, if the ends of the strands which they formed were connected with the solid uncut body of the sheet, he developed the idea of cutting diagonally, or by a stepped system. The cuts were not made and opened simultaneously in each straight row —which, under the then known conditions, was impossible—but they were made and opened diagonally. The first cut in the first row of cuts was made in one corner of the sheet, and this cut, being made from the end of the sheet and therefore free, could be opened out or bent.

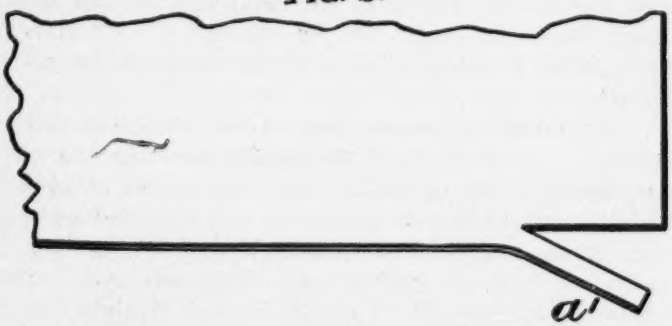
This method is illustrated in the following figures: Fig. 1 shows the upper corner of the sheet which is first acted upon by the cutters. The first cutter operates upon the metal from the outer edge and forms the cut a^1.

FIG. 1.



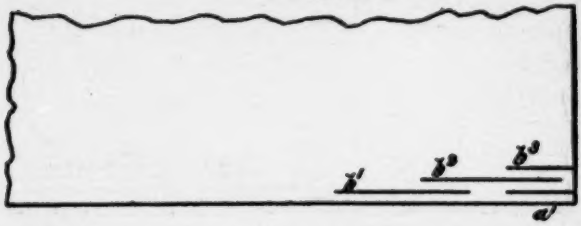
As the little tongue or piece of metal thus formed is freed from the body of the sheet at its outer end, it is, simultaneously with the cutting operation, bent out or expanded as shown in Fig. 2.

FIG. 2.



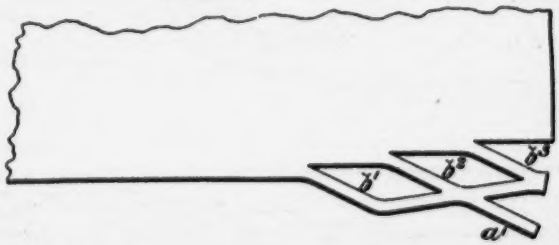
On this first operation one cutter only operates to make the single cut a^1 and to bend out or expand the one strand. On the next operation three cutters operate and make three cuts b^1, b^2, and b^3, as indicated in Fig. 3.

FIG. 3.



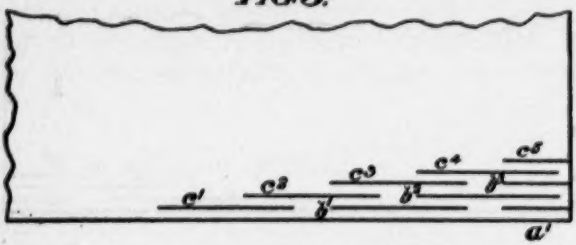
Simultaneously with this cutting operation, however, these three cutters also act to bend the metal strands formed by the cuts, the cutter making the cut b^3 can bend its strand, for the same reason that the first cutter making the cut a^1 could bend its strand, because its extreme end is severed from the sheet. The cutter making the cut b^2 can bend its strand, because the strand b^3 is severed and is free to bend, and the cutter making the cut b^1 can bend its strand because both the strands b^3 and b^2 are free to bend. The resulting opening of the cuts b^1, b^2, b^3 is shown in Fig. 4.

FIG. 4.



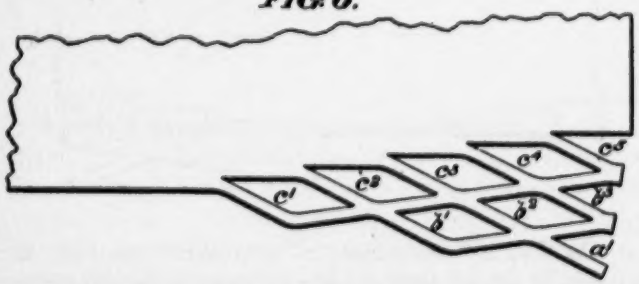
On the next operation five cutters act to make the cuts c^5, c^4, c^3, c^2 *and* c^1 as indicated in the following Fig.:

FIG. 5.



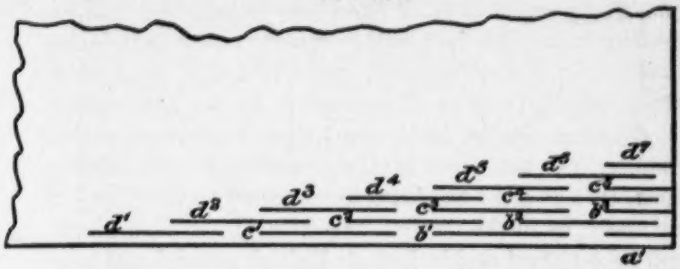
And simultaneously with this cutting operation the cutters also act to bend the metal strands in exactly the same manner as has been described. The cutter making the cut c^5 can bend its strand because its extreme end is severed from the sheet; the cutter making the cut c^4 can bend its strand, because the strand c^5 is severed and is free to bend; the cutter making the cut c^3 can bend its strand because both the strands c^5 and c^4 are free to bend; the cutter making the cut c^2 can bend its strand because the strands c^5, c^4 and c^3 are free to bend, and finally the cutter making the cut c^1 can bend its strand because the strands c^5, c^4, c^3 and c^2 are free to bend; and the sheet thus far expanded has the form shown in Fig. 6.

FIG. 6.

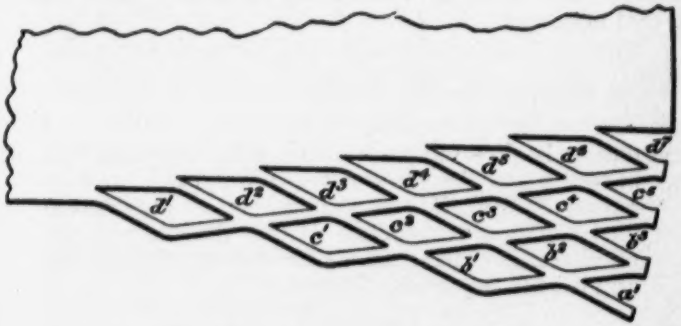


On the next operation seven cutters act upon the sheet to form the cuts d^1, d^2, d^3, d^4, d^5, d^6 and d^7 as shown in Fig. 7.

FIG. 7.



Simultaneously with this cutting operation, and in exactly the same manner as has been described with reference to each of the former series of cuts, the seven cutters open the cuts which they make and produce the partly expanded sheet shown in Fig. 8.



And so on, these operations are repeated until the entire sheet is cut and opened or expanded. It must not be supposed that different sets of cutters are used in each successive cutting and opening or expanding operation. The same cutters are employed, but by reason of the diagonal feed of the metal sheet with reference to the cutters, they are brought into action successively, two more cutters operating each time until the maximum number are in action, at the greatest

length of the sheet, after which the number is correspondingly reduced until the sheet is fully cut and expanded, when the last cutter makes and expands the final cut at the diagonally opposite corner to that at which the first cut at a^1 was made by the first cutter.

It must also be understood that the cutters in thus opening out the strands simultaneously with cutting them, do not bend the strands outward in the plane of the sheet, as in the method described in Golding's original 1884 patent and in Long's British provisional specification and in Johnson's 1885 British patent, but bend them down transversely to the plane of the sheet, as in Golding's 1885 patent 320,240, referred to page 14 *ante*.

In the preceding Figs., however, the strands have been shown opened out laterally in the plane of the sheet, as it is easier to illustrate the steps of the process in that manner.

This process is fully described in the Golding and Durkee Patent No. 320,242, dated June 16, 1885 (B. 77,78).

[Attention is directed to the fact that although this patent bears the same date as Golding's process patent 320,240, it was granted on an application filed nearly a year later. Patent 320,240 was applied for December 13, 1883; Patent 320,242 was applied for September 5, 1884.]

In this patent, reference is made to the original crude disclosure of expanded metal (though not under that term) made in Golding's original 1884 Patent 297,382, and the patentee says (ll. 8-12, B. 78):

> "The nature and object of this invention is to "provide a process whereby the slashed metallic "screening, as described in Patent No. 297,382, "issued to John F. Golding, one of the applicants "hereto, can be successfully manufactured."

And the process is thus described (ll. 17-62):

"The process consists in the employment of a "flat piece of metal of any desired size, and begin- "ing at one side and corner and making an inci- "sion within the side of the metal, thus forming a "strand which is simultaneously pressed away "from the plane of the metal in a direction at or "near a right angle, the position the strand as- "sumes depending upon the distance it is moved "from the plane of the metal. *a* in the drawing "shows the first cut made. The next step in the "process is to make additional incisions, as is "shown at *c*, *b* and *d*, further within the plate of "metal, and leaving uncut sections at the ends of "the cuts, and simultaneously with the cutting the "strands are pressed away from the plane of the "metal at an angle and to the desired position, as "above described. Thus each row of meshes is "simultaneously cut and formed from a blank "piece of metal without buckling or crimping the "blank. In the act of cutting and forming the "meshes, the finished article is contracted in a "line with the cuts or incisions, and consequently "it is shorter in this direction than the piece from "which it was cut, but is greatly lengthened in a "line at an angle to the plane of the original sheet, "plate or blank.

"The object of beginning to cut within one "side and the corner is, that the cut furthest with- "in the metal will produce a strand which as it is "cut and bent downward or away from the plane "of the uncut metal will allow the strands in ad- "vance of it to be freely cut and bent away from "the plane of the metal simultaneously therewith. "It is evident that the meshes could not be cut "and simultaneously formed if the cuts were made "in a single direct line across the metal, for the "reason that as the meshes are made the article "which they form is contracted to a length less "than the original length of the metal from which "it is cut.

"By inspecting the drawing it will be ob- "served that the line between the cut and uncut "parts of the metal is in step form, thus forming "an oblique line across the metal."

It will be noted in the explanation of this second method or process of producing expanded metal, pages 18-21 *ante*, the expansion was carried to the same extent that is shown in the drawing of this patent. The first cut marked *a* in the patent drawing is the same as the cut a^1 in the explanatory figures; the cuts *c*, *b*, *d* are the same as the cuts b^1, b^2, b^3; the cuts *h*, *i*, *j*, *k*, *l* are the same as the cuts c^1, c^2, c^3, c^4, c^5, and the final row of seven cuts (not lettered in the patent drawing) are the cuts d^1, d^2, d^3, d^4, d^5, d^6, and d^7. It will be noted that in each row there is an increase of two cuts.

The substance and essence of this advanced step made by Golding and Durkee, which changed this art from a mere crude suggestion to a practical possibility, and gave it a commercial value was this:

The cuts are made, not in straight rows, but in an overlapping or step by step system; each strand in the rear is severed and released; and **while each mesh is being formed the outer or rear ends of the strands composing it are wholly severed from the body of the sheet.** For example, in the illustrative Fig. 4 (p. 19 *ante*), while the mesh at b^2 is being formed, the outer ends of the strands at b^3 are entirely severed from the body of the sheet, and also while the mesh at b^1 is being formed the outer ends of its strands adjacent to b^2 are severed from the body of the sheet. It is this that enables the *complete meshes* to be made by the simultaneous cutting and bending of the strands.

Machines for carrying out this process or system of simultaneously slitting the sheet and opening out the strands are shown in Golding & Durkee's Patent, 320,241, dated June 16, 1885 (B. 73), in Golding's Patent, 381,231, dated April 17, 1888 (B. 86), and in Golding's Patent, 381,230, dated April 17, 1888 (B. 173).

In the first of these patents, 320,241, two sets of cutters are employed, and the cutters in each set are arranged over-lapping one another, so as to produce

the stepped form of cutting which has been described; that is to say, each cutter in the set forms an incision parallel to, but in a line in front of the line of incision made by the next cutter back of it. The cutters of the lower set are carried by a sliding bar, and those of the upper set by a vertically reciprocating bar. Each of the lower cutters has a bevelled side edge *a*, and each upper cutter has an opposed bevelled side edge *f* (Figs. 5 and 6). When the upper cutters descend these bevelled side edges *f* move along the surfaces of the bevelled side edges *a* of the lower cutters, and move the lower cutters with their bar longitudinally. Consequently, while the cutters are shearing the metal, the lower cutters are also moving longitudinally, and thus permit the cuts to be opened out or deployed in the manner described.

These operations may be shown by exhibits Nos. 9 and 10 in the General Fireproofing case and by exhibit No. 11 in the Bradford case.

This latter contains two upper and two lower cutters. The lower cutters are fixed to a sliding bar which is movable to the right and left in the plane of the cutter faces. The upper cutters are set in the same plane with the lower cutters and are of the lozenge shape shown in patent 381,231 (B. 84). They are in fact old cutters taken from one of the machines (Golding Q. 9, B. 20).

The upper cutters reciprocate vertically and the lower cutters horizontally. The lower cutters are arranged in stepped form and have their forward edges inclined. The upper cutters are arranged with the central point of the lozenge of each cutter immediately above the top of the inclined front edge of one of the lower cutters, with the lower edge extending substantially horizontally and the back edge inclining upward substantially like an extension of the inclined front edge of the lower cutter and in position to act upon

said inclined front edge when the upper cutters descend. It is this action of the inclined back edges of the upper cutters on the inclined front edges of the lower cutters that pushes the series of lower cutters horizontally in the act of cutting the strands and bending them.

When the upper cutters, in this model, are in their raised position, the lower cutters occupy a forward position, *i. e.*, to the right hand, until the lowest point of the upper cutters is nearly over the line of meeting of the two under cutters. The metal to be cut and expanded is placed between the sets of cutters. The upper cutters descend, and as they shear the metal, they move the lower cutters to the left, and this receding movement of the lower cutters permits the upper cutters to pass downward and bend the sheared metal into the form of a mesh. The shearing is continuous with the action of the cutters from the start to the finish of the whole mesh. There are as many cutters as there are meshes in the length of the expanded sheets, each cutter forming one mesh, and the series of cutters acting simultaneously.

As these operations are very difficult to understand counsel proposes to illustrate them at the argument by an operative model.

It will be noted that the receding movement of the lower cutters, during the shearing operation, which permits each strand to be opened out or bent as it is cut, results necessarily in a material shortening in the length of the expanded sheet as compared with the original blank from which it was formed.

It is the same shortening that resulted in the original method of expanding the metal by first cutting it and then pulling it open, as described in Long's British provisional specification, Johnson's British patent and Golding's two earliest patents. When the metal of the strand is bent, it is evident that the two ends of the

cut must be drawn closer together and that the sheet will be correspondingly shortened.

This is very clearly illustrated in the drawings of the Golding and Durkee process patent 320,242 (B. 77), and also in Fig. 12 of the machine patent 320,241 (B. 72), and again in Fig. 14 of the machine patent 381,230 (B. 176), in each of which the dotted line indicates the corner of the sheet which has been cut and opened to form the rows of meshes shown. It will be seen that each row of meshes is shorter in length than the portion of the metal from which it was formed.

This shortening of the sheet is also described in the process patent 320,242, as follows (ll. 51-58, B. 78):

> "It is evident that the meshes could not be "cut and simultaneously formed if the cuts were "made in a single direct line across the metal, for "the reason that as the meshes are made the arti- "cle which they form is contracted to a length less "than the original length of the metal from which "it is cut."

This shortening of the expanded sheet is very material. It varies with the extent to which the strands are bent. It is frequently as much as 15 to 20 per cent.

Several samples of expanded metal made according to this Golding & Durkee process have been produced. In the Bradford case Exhibit 18, Sample I "Full sized partially made sheet, Old process" is a partially completed full sized commercial sheet cut from a blank 110 inches long. This exhibit very clearly illustrates the great enlargement of the sheet due to the expansion and also shows the shortening resulting therefrom. The length of the expanded sheet produced from this blank is 88 inches as shown by the finished side of the expanded sheet. This sheet is therefore shortened 22 inches, or 20% by expansion (Golding Q. 125, p. 58).

Complainant's Exhibit No. 8, "Sample A, Old Process", is a small piece of expanded metal with eight

completed diamond-shaped meshes of comparatively small size; Exhibit No. 12, "Sample D, Old Process" is a piece of larger area having five complete meshes; Exhibit No. 13, "Sample E, Old Process" is a piece partially cut and expanded and illustrates very clearly the step by step or overlapping arrangement of the cuts.

The act of cutting and bending is shown very clearly in Exhibits No. 13, 14 and 15, Samples "A", "B" and "C" offered in the General Fireproofing case and referred to by Mr. R. M. Hunter (G. F. P. p. 62-63). Sample "A" shows the operation at the beginning of the descent of the upper cutters when the strands are partially cut by the horizontal portions; Sample "B" shows the condition after the upper cutters have descended further and the lower cutters have been pushed back to a proportional extent; the cuts have been extended slightly by the cutting action of the inclined edges of the upper cutters, and, at the same time the strands—the outer ends of which have been freed or severed from the body of the sheet—are bent to conform to the shape of the cutting edges; Sample "C" shows the condition of the strands and meshes on a further descent of the upper cutters. This action continues until the upper cutters have reached the lowest position and the horizontal cutters have been pushed back to the greatest extent when the row of meshes is completed.

Exhibit No. 17 in the General Fireproofing case is a full sized blank identical with that from which Exhibit No. 16 was made (Hunter G. F. P. 63). This blank is 96¾ inches long and 7½ inches wide and the sheet (16) is approximately 86¾ inches long and 41 inches wide. The expansion has increased the width 33½ inches, but has reduced the length 10 inches.

Under the method described in Patent 320,242, "Expanded Metal" was first practically and successfully produced and became known by that name.

Before the invention of Golding and Durkee of the method described in letters patent 320,242, expanded metal had no existence, except as a crude, undeveloped idea. Not only was it not a commercial product before that time, but it was not even known as "expanded metal." We have shown (page 16 *ante*) that this term was not used in any of the earlier patents. It was not until after the process of patent 320,242, had been invented, and sheet metal had been practically expanded by that method, that the name was originated by Mr. Golding and his associates.

As to the origin of the name, Mr. Golding testifies (Q. 28, B. p. 26, Q. 169, G. F. P. 98):

> "It originated in 1884 or 1885 when we had "just made a small amount of material under our "second process patent. When it happened to "become evident that we could make this metal "commercially, it became necessary to have some "name that would express some recognizable fea- "ture of it and hence we adopted the name, 'Ex- "panded Metal.'"

As soon as it became possible to expand metal commercially, the value and utility of the product were quickly recognized, and the metal was rapidly adopted and became extensively used. Golding and Durkee had created a new industrial art—the art of expanding sheet metal.

This art was introduced both in this country and in England, and was practiced more or less extensively. This process is still practiced to a very limited extent in this country; but it has been entirely abandoned in England, and substantially so, here for the more efficient process of the patent in suit (Golding, Q. B. 24, p. 24, Q. 171, G. F. P. p. 99).

The Golding & Durkee process, of Patent 320,242, was deficient and produced an article which was restricted in the uses to which it might be put.

While the Golding & Durkee process of patent 320,242, undoubtedly advanced the art from a crude impractical suggestion to a commercial stage, it only partially developed it. Expanded metal became a commercially useful article, and became more or less extensively used, but the metal, as produced, possessed characteristics and defects which restricted its uses, and those characteristics and defects were inherent to the method of production.

The process was one that was adapted for expanding thin metal only and produced a product that was more or less irregular and unsightly.

Expanded metal is used for a great many purposes. It is used for screens, window-guards and partitions, and recently, to a very great extent, for the walls of metallic clothes closets or lockers; but by far the principal uses are as lathing to hold plaster on ceilings and walls, and as the metallic reinforcing member in the construction of concrete walls, floors and arches. In "reinforced concrete" structures the compressive strength of concrete is combined with the tensile strength of metal. This is accomplished by imbedding metal frame-work, bars or sheets in a body of concrete, and expanded metal is especially adapted for this purpose, provided it is of the proper strength and character.

The Golding & Durkee process of patent 320,242, was far from satisfactory. While expanded metal so made, could be, and was, extensively used, as metallic lathing, for screens, where symmetry was not essential, and as a tension member for reinforcing concrete for short spans, where material strength was not required, it could not be used for office screens and partitions, where symmetry and proper fitting are required, or in

concrete reinforcement where strength is necessary. The principal defects of the Golding & Durkee process of patent 320,242, are as follows:

1. The sheet is materially shortened. As has been pointed out, this shortening is often as much as 15 to 20 per cent., consequently, to produce a sheet of expanded metal of any given length, it is necessary (under this process) to cut it from a blank much longer than the length of the sheet desired. (See Bradford Exhibit 18 and "G. F. P." Exhibits 16 and 17).

2. Because of the shearing cut, the thickness of the metal is limited; it is impractical to cut metal more than 3-32 of an inch thick in this way (Golding, Q. 13, B. 21, G. F. P. 19).

3. The strands of the meshes do not lie in straight lines. This results from the stepped method of cutting the sheet on lines diagonal to its length, and may be observed in any of the samples of the metal produced by this method. It is perhaps more clearly shown in the partially cut samples "B", "C" (Exhibits 14 and 15 in "G. F. P."). If these samples are held with the uncut portions in a horizontal position (which is the position the metal occupies while being cut and expanded), it will be noted that the diagonal strands are not in straight lines. From this it results that the intersections are out of square, and that a line drawn through the intersections in one direction will not be at right angles to the line drawn through the intersection in the other direction. In consequence of this, the finished sheet is not only irregular in appearance, but is less strong than it would be if the strands were in straight lines and the intersections square with one another.

4. The strands are not of uniform width throughout. Owing to the shearing cut, and the fact that the outer ends of the strands are free, *i. e.*, severed from the body of the sheet, the strands are somewhat wider

at one end than at the other. This may be observed in any of the samples of metal made by the old process. This irregularity in the width of the strands not only makes the sheet unsightly and unsuitable for exposed screens, &c., but weakens the sheet as a tension member for reinforced concrete constructions, where uniform strength is required throughout, since the strands have only the strength of their smallest section.

5. The strands are more or less wavy and crooked. This also results from the fact that the outer ends of the strands are free or severed from the body of the sheet, while they are being bent, because, for this reason, they are not subjected to sufficient tension to straighten them.

6. The sheets are not square or rectangular. To obtain a rectangular sheet it is necessary to cut off triangular pieces at each end. Not only is this a waste of expanded metal, but the boundaries are not then at right angles to the meshes and the sheet is unsightly when fitted to metal frames.

Each of these defects is a result of the process or method. They are not due, as has been suggested, to the character of the machines, but are inherent to the method of expanding. It is not practical to cut and bend heavier metal in this way, or to prevent the shortening of the sheet, by the mere bending open of the strands, or to make the intersection of the lines of the meshes at right angles, or the strands of even width throughout, or to straighten out the strands and remove the wavy appearance, when the outer ends of the strands are free or severed from the body of the sheet.

Any machine capable of performing this process will produce these defects in the metal to a greater or less extent, because the defects are inherent to the process and cannot be separated from it. Owing to these defects, expanded metal was necessarily restricted to those uses where neatness of appearance and uniform-

ity of strength, as well as material strength, were not essential or important.

Restricted to light metallic lathing and to rough screening, there was not much field for expanded metal, and, indeed, it was not until the development of reinforced concrete construction, and the application of expanded metal to that use, that it became extensively employed.

But for this purpose, also, the metal of this process was very unsatisfactory. It was so limited in thickness and strength that it could be used for small spans only and for carrying light loads; for the greater part of concrete reinforcement, it was unsuited. It resulted that the metal, expanded by this process, was largely limited to use as light lathing. And the same condition existed both here and in England, where Mr. Golding had introduced the process (Golding Q. 24 B., p. 25, Q. 171, G. F. P. p. 99). Since the introduction of the new process of the patent in suit the use of the old process, in England, has been entirely abandoned; it is still used in this country to a limited extent; it was never used in the Continental countries of Europe (G. F. P. p. 99).

This rather extended exposition of the prior state of the art has been made, because every invention is to be measured by the existing state of the art at the time the new invention came into being. We can determine what contribution a patentee has made to the fund of public knowledge, and intelligently read and understand his patent only by ascertaining first, what had been done previously, and unless his contribution amounts to a material and substantial step in advance —to an appreciable and useful addition to the public fund of knowledge, he is not an "inventor" within the spirit of our laws, or entitled to protection as such.

In every case, therefore, the prior state of the art should be clearly and definitely ascertained before the

patent in dispute is examined. It fixes the starting point, from which the advance is to be measured.

The evidence in this case, so far as it has been considered, shows the following state of the art prior to 1894, the date of the invention described in the patent, 527,242, in suit:

1. The first suggestion for making what is now known as "expanded metal" was made by one Long in 1862 in the British provisional specification, No. 2125, dated July 26, 1862.

2. Complainant's patentee, Golding, in United States Patent 297,382, dated April 22, 1884, first suggested the same idea in this country, and in a subsequent Patent, No. 320,240, dated June 16, 1885—(this patent was applied for December 13, 1883), described a method of making such metal on a plan somewhat different from that disclosed by Long and by himself in his Patent 297,382.

3. Johnson in British Patent 11,332, of 1885, also disclosed the idea in substantially the manner and to substantially the same extent as it had been disclosed by Long and by Golding in this first Patent 297,382.

4. In these first suggestions made by Long, Golding and Johnson, the sheet of metal was first cut, and then, by a subsequent and independent operation, the cuts were pulled open, either by pulling the sheet out in the direction of its own plane, or by bending the strands open transversely to the plane, as suggested in Golding's Patent 320,240.

5. Neither of these methods was practically successful; no expanded metal was, or could be, made under them in a practical or commercial manner; and these four patents amounted to nothing more than a mere disclosure of a crude undeveloped idea, requiring further expenditure of inventive thought, before it could be reduced to practice and made available for the public needs.

6. Golding and Durkee, disclosed in their Patent 320,242, the first method or system by which the original crude ideas of the first four patents could be reduced to commercial practice and rendered useful. This consisted in the simultaneous cutting and bending of the strands to form **complete meshes, each mesh being formed while the outer or rear ends of the strands composing it are wholly severed from the body of the sheet.**

7. Under this process of Patent 320,242, expanded metal was successfully and extensively made, and went into general use.

8. The expanded metal so made was:

(*a*) Limited in thickness and strength; (*b*) materially shortened in length to an extent equal to 15 to 20 per cent.; (*c*) lacking in strength, beyond its limitation in thickness, because the meshes could not be made at right angles to one another, which is necessary to afford the greatest strength; (*d*) of unequal strength throughout because of the impossibility of forming the strands of even width; (*e*) irregular in form.

9. While expanded metal so made, could be and was, extensively used, as metallic lathing to hold plaster in walls and partitions; for screens, where symmetry was not essential; and as a tension member embedded in concrete arches and floors, for short spans, where material strength was not required, it could not be used for office screens and partitions, skylights and window-guards, metallic locker walls and the like, where symmetry was essential and proper fitting to metallic frames was required, or in concrete arches and floors of substantial span where strength is essential.

Such was the state of the art at the date of the invention by Mr. Golding, of the process disclosed in the Patent 527,242, involved in this case.

COMPLAINANT'S PATENT IN SUIT.

In the method of producing expanded metal described in complainant's patent in suit, 527,242, the inventor, Golding, made a radical departure from the former method employed by him, whereby the deficiencies and limitations of expanded metal were entirely removed, and the character of such metal was so greatly improved that its adaptability and availability for commercial use was greatly extended.

It will be noted that in the original crude suggestion of Long, Golding and Johnson, in which the sheet was first cut and then pulled open or bent to form the meshes, there was necessarily a material shortening of the sheet, and Golding and Durkee fully recognized this necessity in their patent, No. 320,242, in which, in explanation of the reason for the stepped system of cutting, and the opening of the strands in the manner described, they say (ll. 51-58, B. p. 78):

> "It is evident that the meshes could not be "cut and simultaneously formed if the cuts were "made in a single direct line across the metal, for "the reason that as the meshes are made *the arti-"cle which they form is contracted in length less "than the original length of metal from which it is "cut.*"

This shortening of the sheet existed in the original form of expanded metal described in the Long, Johnson and earlier Golding patents, as well as in the Golding & Durkee process. It was the inevitable result of the bending of the strands *after their ends had been severed from the body of the sheet.*

The expanded metal produced in this manner was unsatisfactory, and Mr. Golding, as a result of experiments conducted by him (Q. 10 B. p. 10, G. F. P. p. 19), discovered a method or process of expanding metal

without bending the strands after their ends had been severed, so that the sheet would not be shortened.

In the former process of Golding & Durkee the strand was severed and bent into the *full mesh* or opening; Mr. Golding discovered that by making only a *half mesh* at a time and *stretching* the strands without severing their ends, he could, by a combination of operations, form complete meshes and make expanded metal without any shortening of the sheet.

It was known that metal strands could be cut, bent and stretched at a single operation, but such cutting, bending and stretching did not form meshes such as must exist in expanding metal, and what Mr. Golding discovered was a way of combining such operations of cutting, bending and stretching, so that, while each operation made but an incomplete, or half mesh, the combination of successive operations would make complete meshes and thus expand the metal.

By this method, not only could the original length of the sheet be preserved, while it was expanded to an extent equal to that of the former process, but perfect symmetry could be obtained, both in the strands themselves and in the lines of the meshes, and metal of greater thickness and strength could be employed, and the tensile strength of the strands could be increased by reason of the stretching action to which they were subjected.

On May 7, 1894, Mr. Golding applied for a patent on this new process or method, which resulted in the patent in suit, No. 527,242, dated October 9, 1894 (Complainant's Patent in suit, B. pp. 61-62).

In this patent, after referring to the first original and crude suggestion of making expanded metal by first cutting the sheet and then opening the meshes by a subsequent and independent operation (ll. 8-15), and to the method of simultaneously cutting and opening the meshes by the stepped system of cutting, described

in Patents 320,242, 381,230 and 381,231 (ll. 15-25). Golding thus described his improvement (ll. 25-60):

> "In my present invention I seek to avail myself of the ability of the metal to stretch or distend as well as of its ability to bend under strain or pressure, and the invention consists in the improved method of making expanded metal, viz., by simultaneously cutting and opening or expanding the metal at the cuts by stretching the several portions.
>
> "In the practice of the invention, I prefer to make a series of slits in a straight line across the edge of the sheet, and at the time of cutting the slits and as a continuation of that operation to depress or stretch the severed metal, *i. e.*, those portions of the sheet lying outside of the cuts, in a direction at right angles to the sheet, without any contraction from the length of the original sheet. This operation is then repeated after the sheet has been fed forward, the slits being made opposite the portions unsevered at the previous operation, and so on until the entire sheet is expanded.
>
> "My invention allows the use of a single straight under knife, which of course does not need to be shifted in changing the location of the cuts, and the upper cutters are also arranged in a straight line, but their acting edges represent a corrugated form of alternate transverse projections and recesses adapted to co-act with the under knife in cutting the slits at the proper intervals and to stretch the severed strands, and either the upper cutter or the sheet is shifted back and forth between the operations as will be understood."

The patent illustrates means by which the process may be carried out. There is a set of upper movable cutters and a lower knife C, the latter being preferably stationary. The lower edges of the upper movable cutters are formed with projections *b*. The sheet of metal A is placed between the cutters with the edge which is

to be cut and expanded projecting over the edge of the lower knife C, as shown in Fig. 3. When the upper cutters descend they cut a row of slits in the edge of the sheet (see dotted lines in Fig. 4) and simultaneously bend the strands thus formed down into the position shown at *m* in Fig. 2.

As the ends of the strands which are being formed are connected with the uncut body of the sheet while the cutting is progressing, there can be no contraction or shortening due to their bending, and consequently the bending results in drawing out or extending the metal of the strands into an elongated form.

The sheet is then fed forward and the next row of meshes is formed by similarly cutting, bending and elongating the strands and so on until the whole sheet is cut and expanded. The successive rows of cuts and strands alternate, *i. e.*, each row is formed back of the unsevered portions of the preceding row. This is effected either by moving the sheet longitudinally, when it is moved forward, or by shifting the cutters.

The result of this operation is thus described by the patentee (p. 1, l. 98—p. 2, l. 5):

> "The bend given to the severed portion, or "strands, as they are usually called, is in a direc- "tion at right angles to the plane of the sheet, and "as there is no contraction in the length of the "metal, it necessarily follows that the expansion is "obtained from the stretching, distension or elon- "gation of the severed strands."

The patent contains but one claim, which is as follows:

> "The herein described method of making open "or reticulated metal work, which consists in "simultaneously slitting and bending portions of "a plate or sheet of metal in such manner as to "stretch or elongate the bars connecting the slit "portions and body of the sheet or plate, and then

"similarly slitting and bending in places alternate "to the first mentioned portions, thus producing "the finished expanded sheet metal of the same "length as that of the original sheet or plate, sub- "stantially as described."

This claim has been criticised as not clearly defining all of the necessary features of the invention. The subject of the sufficiency of the claim and its proper construction are considered at length, page *post.* The matter is merely mentioned here for the purpose of calling the attention of the Court to the fact that the words of the claim are those selected by the Patent Office Examiner for the purpose of defining the patentee's invention over the prior art, which is now cited against it.

THE PRIOR GOLDING AND DURKEE PROCESS AND THAT OF THE PATENT IN SUIT COMPARED.

The method described and claimed in the patent in suit differs radically from the Golding and Durkee method of patent 320,242.

In the former the outer ends of the strands were severed from the body of the sheet and *complete meshes* or openings were formed at each operation *by bending* only; in the new process the ends of the strands are not severed from the body of the sheet and *only half meshes* or openings are formed at each operation *by bending and stretching.* In the former process a complete opening or mesh was made at *each* operation; in the new process the complete opening is made by *two* operations, each operation makes but a half mesh, but the *combination* of the two produces the whole.

In the former process the bending of the severed or free strands into the complete mesh required that the cuts should be made in stepped form, in the new

process this is not necessary, the half meshes may be made in straight lines.

There are other important differences between the two methods pointed out by Mr. Golding (pp. 30, 187, and by Mr. R. M. Hunter (pp. 109-110), in addition to these mentioned, but as they relate rather to the *results* of the processes and not the processes themselves they are considered at p. 42 *post*.

Aside from any such differences in the results produced by the two processes, the processes themselves differ in these essential respects.

(1) In the old process a complete mesh or opening is formed at each operation; in the new a half mesh only is formed, and two operations must be performed and combined together in a certain way to produce a complete mesh.

(2) In the old process the outer ends of the strands, while being bent, are severed from the body of the sheet; in the new process both ends of the strands must be connected with the body of the sheet while being bent.

(3) In the old process meshes or openings are formed by bending the strands only; in the new process the meshes are formed by stretching the strands into the bent form.

(4) In the old process the cuts must be made and the strands bent in stepped form; in the new process they may be made in straight lines.

(5) In the old process the successive cuts in alternate positions must be made simultaneously; in the new process they must be made by successive operations (see p. 64 *post*).

Several samples of metal made by the new process have been produced. Those offered in the Bradford case are as follows: Exhibit No. 9, "Sample B" is a

small piece of ¾ inch mesh; Exhibit No. 14 is a small piece of heavier and thicker metal with larger meshes; Exhibit 15 is partly cut showing one row of three complete meshes with the attached strip, and Exhibit 17 is a full sized sheet produced from an eight foot blank. Exhibit 16 is a blank corresponding with that from which Exhibit 17 was made. In practice the blank would be cut and expanded much more than in Exhibit 17. The blank in that exhibit is only partially expanded. A small unexpanded strip remains at the outer edge which is cut off. It is like the uncut strip in Exhibit 17 but much narrower.

The following are the exhibits of this metal in the General Fireproofing Case: Exhibit No. 7 is a small piece fully expanded; Exhibit No. 8 has the half meshes partially formed; No. 18 consists of two full sized sheets cut from a single blank, like No. 19, and No. 20 is another full sized sheet.

THE SUPERIORITY OF EXPANDED METAL PRODUCED BY THE NEW PROCESS AS COMPARED WITH THE METAL PRODUCED BY THE OLD PROCESS OF GOLDING & DURKEE.

We have pointed out the differences in the processes; and page 31 *ante*, have enumerated the defects of the expanded metal made by the old process; we will now consider the effect of the new process in overcoming these defects. These are not to be considered as differences in the processes, but as the results of those differences.

(1) The sheet is not shortened. Instead of a loss in length amounting to as much as 15 to 20 per cent., the finished sheet is the same length as the original blank. This may be observed by comparing the blank (G. F. P. Exhibit 19), with the full-sized sheets (G. F. P. Exhibit 18).

(2) The metal is not limited to sheets and resulting strands of 3-32 of an inch in thickness, but may be made of very heavy metal (Golding G. F. P., p. 187, Q. 24, p. 19).

(3) As the strands may be cut, bent and elongated in successive straight rows in the length of the sheet, all of the meshes are perfectly square with one another; a line drawn through the intersections of the meshes in one direction is exactly at right angles with a line drawn through the intersections in the other direction. From this it results that the expanded sheet is not only regular in form and appearance, but has the maximum possible strength afforded by the thickness of the metal and the size of the meshes.

(4) The strands are of uniform and regular width throughout, and the sheet is therefore excellently adapted for exposed screens or partitions in banks, office buildings, and the like, and for the walls of metallic lockers.

(5) There is no irregularity in the width of the strands, and the meshes being square with one another and capable of being made of very thick and heavy metal, these sheets are peculiarly adapted for use as the tension members in concrete arches and floors and for very great spans. Their strength, and consequently their adaptability for this, as well as for other uses, is greatly increased by the physical or molecular change in the strands due to their elongation (see p. 44 *post*). In fact this use in concrete floors and arches is the principal and most valuable use to which the new metal is put.

(6) The elongation of the strands by the pressure of the cutters necessarily subjects the strands to such great tension that they are drawn out into perfectly true straight lines and remain permanently in that

condition because of the molecular change they have undergone.

(7) As the meshes are perfectly square with one another, perfectly square sheets are produced which may be neatly and economically fixed to iron frames.

By referring to the defects of the metal produced by the old process (p. 31 *ante*), it will be seen that in every point the new process has overcome the difficulty of the old, without the sacrifice of a single advantage which the old possessed. The same sized blank will make a larger, stronger, neater and better sheet in every particular. Mr. Golding reviews the advantages on pages 30 and 187 of the G. F. P. Record and also on pages 10 and 24 of the Bradford Record.

THE INCREASE IN TENSILE STRENGTH DUE TO THE STRETCHING OF THE STRANDS IN THE NEW PROCESS.

It is well known that when a cold rod of steel is drawn out or elongated, it undergoes a physical or molecular change by which, as its diameter is reduced, its tensile strength is increased to a remarkable extent; and this principle is employed in the art of making steel wire, by drawing a cold steel rod through holes of successively reduced diameter. It is known as "wire drawing". The change which the steel undergoes under these conditions is well recognized to be due to physical and molecular modifications, whereby the particles are squeezed into compact and interlocking relationship.

Of course the strands of expanded metal cannot be and are not, strictly speaking, "wire drawn," but the elongation produced in them by the stretching action of the cutters in the new process, produces a similar physical or molecular change, whereby their tensile strength is greatly increased.

Mr. Golding testifies (G. F. P., p. 156) that a series of tests conducted for him in London, by Kilkaldy & Co. and in Chicago and Pittsburg by Robert W. Hunt & Co. show that the tensile strength of the strands due to the stretching is increased from 20 to 50 per cent.; and Mr. Lewis E. Curtis, who took part in the making of some of the tests by Hunt & Co., at Chicago, with strands like those of Complainant's Exhibit No. 20, testifies that the tests showed an increase in tensile strength of from 65 to 75 per cent (Lewis Q. 5-7, G. F. P., p. 83). The increase in tensile strength is also referred to by Mr. R. M. Hunter (Q. 13, G. F. P., p. 73).

The defense does not deny this increase in tensile strength, but objects that, while it exists, it is not an advantage but a defect, because it renders the strands brittle, and claims that, because of this, annealing is resorted to to remove the brittleness. Annealing is a process of heating metal and allowing it to cool gradually for the purpose of removing brittleness and restoring elasticity. This they contend removes any increase in tensile strength that may have been produced by the stretching. Mr. William H. Ham has produced some samples, partly annealed and partly un-annealed, by which the greater brittleness of the un-annealed metal is shown. The defense also calls attention to the fact that all of the heavy expanded metal made under the new process by the Central Expanded Metal Co. (Chess Brothers), of Pittsburg, was annealed. This, until recently, constituted nearly all of the heavy metal used for reinforced concrete that was made in this country.

It is true that the increase in tensile strength, due to the stretching, is accompanied by an increase in brittleness, *and whether it is an advantage or a defect depends solely upon the extent to which the stretching is carried.* If the strands are stretched so much that the increase in brittleness is a greater loss than the

gain in the increased tensile strength, annealing must be resorted to; but if the stretching is carried to that extent only which will not render the strands too brittle, annealing is unnecessary, and the increase in tensile strength is a decided advantage.

We must remember that this question concerns only the heavier forms of expanded metal which are used for concrete reinforcement, and it is a decided advantage in such metal that its elasticity should be reduced and its tensile strength increased (Lewis Q. 13-14, G. F. P., p. 84, Golding Q. 168, G. F. P., p. 98).

It is true that the metal of this character made by the Central Expanded Metal Co., under Complainant's license, was annealed, but it is a question whether such annealing was necessary or desirable, and, as Mr. Golding testifies, annealing is not practiced by the licensees abroad or in Canada (G. F. P., p. 97-98. See also Lewis RDQ. 91, G. F. P., p. 93). The reason the Central Expanded Metal Company anneal their product is because they stretch their strands to a greater extent than do the other licensees. Expanded metal like Exhibit No. 20, which was made by the Northwestern Expanded Metal Co. of Chicago on a machine similar to that used in Canada (Lewis Q. 4, G. F. P., p. 83)—on the strands of which the tests referred to by Mr. Lewis were made—is not annealed (Lewis Q. 8-10, G. F. P., p. 84). If the Court will compare G. F. P. Exhibit No. 20—the unannealed product of the Northwestern Expanded Metal Co.—with G. F. P. Exhibit 18, made by the Central Expanded Metal Co., it will become apparent that the strands of the latter are stretched to a greater extent than those of Exhibit 20. Exhibit 20 was made on a machine similar to that used in Canada (Lewis XQ. 38, G. F. P., p. 86). It was the *excessive* stretching of the heavy metal for reinforced concrete made by the Central Expanded Metal Co. that rendered the strands brittle and made

annealing advisable; if the stretching is not excessive, as in the metal like Exhibit 20 made by the Northwestern Company and abroad, the brittleness is not excessive, and the increase in tensile strength and the reduction in elasticity is a decided advantage in concrete reinforcement.

And this is admitted by Mr. Julian Kennedy, the defendant's principal expert (Q. 8, G. F. P., p. 200):

> "This additional stretching of course hardens
> "the metal, making it at the same time brittle, so
> "that it is customary *where the metal has been*
> "*considerably stretched* in expanding to anneal
> "the product before use * * * * * * *
> "*To the extent, however, that this operation makes*
> "*annealing necessary*, it is a bad one, and it will
> "require a better and softer steel to use it than
> "would be necessary with the older operation
> "other things being equal."

It is only when the metal has been excessively stretched that annealing is necessary; it is not necessary when the metal is stretched to the proper extent. Mr. Kennedy's statements above quoted are sound and agree with the facts, but his opinion that the stretching and the resulting increase in the tensile strength is not beneficial is based on a misapprehension of the facts. He says (G. F. P., pp. 200-201):

> "The fact that *all* heavy expanded metal in-
> "tended for use in concrete construction, where
> "strength and reliability is important, is in prac-
> "tice annealed, shows that the change in the metal,
> "due to the large amount of stretching is one that
> "is not desirable in itself."

Mr. Kennedy was not aware that the practice abroad (where more of this metal is produced than in this country, Golding Q. 175, G. F. P. p. 100) and of the Northwest-Expanded Metal Co. of Chicago, was not to anneal. The reason that metal is not annealed is be-

cause the strands are not stretched to such an extent that the defect of brittleness is in excess of the advantage of the increase of tensile strength.

This is not after all a material question. Even if it were true that the brittleness of the strands, due to the stretching, was a defect which required annealing to cure it, that would not affect either the novelty of the process or its advantages in other respects. The fact is, however, that when the process is properly carried out to obtain it—and the strands are not stretched to excess—this increase in tensile strength is one of the valuable results of the process in the production of those forms of expanded metal intended for concrete reinforcement. The novelty and utility of the process does not, however, depend upon it, and it is perhaps, for the purposes of this case, unimportant.

THE NEW PROCESS HAS REVOLUTIONIZED THE ART OF EXPANDING SHEET METAL, AND THE PRIOR GOLDING & DURKEE PROCESS HAS BEEN PRACTICALLY ABANDONED THROUGHOUT THE WORLD.

It has been pointed out that the production of expanded metal under the Golding and Durkee process was restricted, because the uses to which such metal could be applied were limited by the character of the metal.

When the use of reinforced concrete became general, the field for expanded metal was greatly increased, but the metal produced by the Golding & Durkee process was utterly unsuited to meet the requirements. Much heavier and more uniform sheets were required in the greater and more important portion of the work. This demand the Golding & Durkee process was unable to meet. The sheets made by that process were suited to short spans and light loads only.

With the introduction of the new process, however, the metal was so improved in character, weight and strength, that it was able to meet this demand.

The result has been that the use of the Golding & Durkee process has been practically abandoned. This applies not only to the use of the process for making heavy sheets for reinforcing concrete, for partitions, screens, etc., but also for making metallic lathing, where weight and symmetry are unimportant. At the present time in the United States there are only two or three machines in use for making lathing by the Golding & Durkee process, and only one—which is occasionally used—for making light concrete reinforcement (Golding Q. 171, G. F. P. p. 99.)

After the invention of the new process Mr. Golding visited England, where he had previously introduced the Golding & Durkee process, and upon the introduction of the new process the old process was entirely abandoned (G. F. P. p. 20; 99).

The old process was never used on the Continent of Europe; the new process is practiced in France, Germany, Spain, Austria, Russia, Belgium and Hungary (Q. 23, G. F. P. p. 18). It is also practiced in Canada, and in this country at factories in Pittsburg, Boston and Chicago (G. F. P. p. 18; 100).

About 10,000 tons of metal are made annually by the licensees under the patent in this country and a somewhat larger amount abroad (Golding Q. 113-175, G. F. P. p. 100).

It has been suggested by the defense that the great increase in the use of expanded metal, which has occurred since the introduction of the new process, is not due to the new process, but to the increase in the demand for such metal, owing to the development of the fire-proof construction of buildings and of the use of reinforced concrete. There is no doubt that there has been a great increase in the demand for such metal

in recent years, but had it not been for the improvement in the process of production, it would not have been possible to meet that demand. Certainly the metal made by the Golding & Durkee process could not have done so.

Regarding this Mr. Golding says:

"It was not until this new process was in-"vented that any considerable sale of expanded "was made, excepting such as was made in very "light steel, such as was used for lath in holding "plaster." (G. F. P. 20.)

"The American and English Companies have "been very sucecssful in the practice of the patent "in suit. They have been enabled to make most "satisfactory small mesh lathing from 26 gauge "steel, and all sizes of meshes and thickness of "metal desired up to the large meshes from steel "about a half an inch in thickness, and the finished "plates having regular margins and having inter-"sections always at right anges to each other." (G. F. P. p. 100.)

"I am certain that had I not invented the "process of patent No. 527,242 in suit, and had "concrete construction made the strides which is "manifest to-day, expanded metal would have "played a very meagre part therein, because of "the limitation upon and imperfections of the ex-"panded metal prior to the patent in suit." (G. F. P. p. 101.)

The superiority of the new process over the old is particularly evidenced by the fact, that, although the Northwestern Expanded Metal Co., at Chicago, and the Eastern Expanded Metal Co., of Boston, were equipped for making the metal by the Golding & Durkee process, they found it necessary to purchase the greater part of the metal used for concrete reinforcement from the Central Expanded Metal Co., of Pittsburg, which was making it by the new process (Lewis XQ. 44, G. F. P. p. 87; Kearns XQ. 141-144,

G. F. P. p. 193). Mr. Kearns, one of the defendant's witnesses, and a former employee of complainant's licensees, says that during the time he was connected with the Eastern Expanded Metal Co. (the Boston licensee), they purchased all heavy expanded metal for reinforcing concrete from the Central Expanded Metal Co. During 1904, their purchases amounted to 2,300,000 square feet, all of which was made by the new (third) process. (The new process is here spoken of as the third process, counting the original Long-Golding-Johnson idea.) Mr. Kearns testifies that since 1900 he has no recollection of the use by the Eastern Expanded Metal Co., of any of the metal of large size made by the second, *i. e.*, Golding & Durkee process (XQ. 168-171, G. F. P. p. 195).

It was not until recently that the Northwestern Co., became equipped for expanding metal for concrete reinforcement by the new process. (It had one original machine, referred to p. 101 *post*, for practicing the process, but that was not adapted for producing the metal required for this purpose.) When this company undertook to extend its equipment, it adopted machines for carrying out the new process. The first machine of the kind was that designed by Mr. Lewis from the Canadian machines (Lewis RDQ. 84-86, G. F. P. p. 92). It was this machine on which Exhibit No. 20 was made; and that company had under construction, or was preparing to construct, when proofs were taken, three other machines, of which one is designed for making lathing only (RDQ. 87, G. F. P. p. 92), and the machines for expanding by the old process are consigned to the scrap heap (RDQ. 88, G. F. P. 93). It is to be noted that this preference for the new process applied not only to the heavy metal for reinforced concrete but to lathing also. This preference is not due to a mere difference in the character of the machines, but to a difference in the character of the metal

which they produce, and that difference is due to the difference in the processes. The metal produced by the Golding & Durkee process was not unsatisfactory because of a defect in the machines, but because of a defect in the process. The machines were made to perform that process as perfectly as the process was capable of being performed. The fault was wholly in the process. The new machines are no better, as machines, than the old; they do produce a better product, but that is not because the machines are better machines, but because the process which they carry out is a better process.

No matter what machines may be used to expand metal by the Golding & Durkee process, the metal produced will have the faults referred to p. 31 *ante*, because those faults are inherent to that process; and no matter what machines may be used to expand metal by the new process, the metal will have the advantages referred to page 42 *ante*, because those advantages are inherent to the process.

Were this not so, the Eastern Expanded Metal Co., and the Northwestern Expanded Metal Co., would have amended their machine to produce metal by the Golding & Durkee process rather than purchase the more important part of their product from a competing licensee. It was the superiority in the metal they were seeking, and that superiority was due to the process by which it was produced.

But perhaps the strongest proof of the commercial superiority of the new process is that the defendant has adopted it. At the time the defendant engaged in the business of expanding metal, a few months before the bringing of this suit (A. P. White, G. F. P. p. 237), the patent 320,242 on the Golding & Durkee process had expired. That process was public property, and the defendant was quite free to adopt it. A. P. White,

the promoter of the defendant company, was aware of this (XQ. 48-50, G. F. P. p. 238).

Instead of adopting the old process, however, the defendant adopted the new, and preferred to take the chances of a suit for infringement. Under such circumstances we submit that it comes with bad grace from the defendant to say that the new process possesses no superiority over the old, and that the differences are only in the construction of the machines. The defendant was free to use and construct machines for practicing the Golding & Durkee process without liability to suit for infringement.

INFRINGEMENT.

In the General Fireproofing case infringement is admtited by defendant's expert Julian Kennedy (XQ. 21, G. F. P. p. 204; XQ. 30, G. F. P. p. 205) and by A. P. White, the Vice President of the company (XQ. 35-39, G. F. P. p. 237).

In the Bradford case the defendant's expert Coombs (XQ. 81, B. p. 154) admits that the defendant's machine performs the exact steps specified in the claim. The only difference that he has been able to point out is that defendant's metal, when expanded, is slightly *longer* than the original blank.

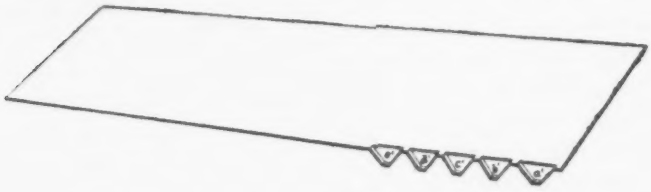
As this elongation is approximately between .3 and .7 of one per cent. (XQ. 82, B. p. 154) it is not believed that it will be seriously considered as evidence of non-infringement. It has been pointed out that under the old process the sheet was shortened under expansion from 15 to 20%. One of the results of the new process is that this shortening is avoided, and it can hardly be seriously contended that infringement can be escaped because there is a slight elongation, which, in the 110 inch blank used in making Brad-

ford exhibit 18, Sample I, would not amount to more than four-fifths of an inch. Defendants cannot steal the saving of 22 inches, which the new process has produced, because they have increased that saving by a fraction of an inch. As Mr. Golding points out, the production of a sheet mathematically the exact length of the original blank is hardly possible. There may be slight shortening due to the distortion of the end meshes during the operation of cutting (XQ. 102, B. p. 43). If the metal is hard and springy there will be a slight tendency for the bent strands to spring back or close up again, and this will produce a very slight elongation (XQ. 98, B. p. 42). This is just what happens with defendant's metal. Such slight shortening or elongation as may occur is not due to any difference in the process, but either to the character of the metal used or to a slight imperfection in the cutting.

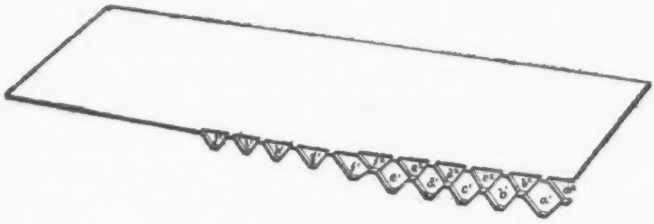
Defendants in the Bradford case have also attempted to escape infringement on the plea that in the making of their metal the half meshes in any row are not made simultaneously but successively. Defendant's metal is made on a machine generally similar to that shown in the Bradford patent 664,379, dated December 25, 1900 (B. p. 89-98). This machine has a series of corrugated rotary cutters. The blank is fed diagonally and the corrugations of each cutter, cut, bend and stretch the half meshes of one row. The half meshes in each row are not formed simultaneously but successively. The relations of the operations of simultaneously cutting, bending and stretching the strands in successive rows are, however, identical with those of the complainant's patent. The metal is first simultaneously slit and bent in such manner as to stretch or elongate the strands and form half meshes, and is then similarly slit and bent in places alternate to the first mentioned places to form a second set of half meshes which combine, with the first set to form the

complete meshes. The only difference is that with the particular instruments shown in the patent all the cuts in each row are made simultaneously, while with the particular instruments used by Bradford the cuts in each row are made successively. In one case the cutters reciprocate, in the other they rotate. The difference is in the instruments employed, not in the steps performed.

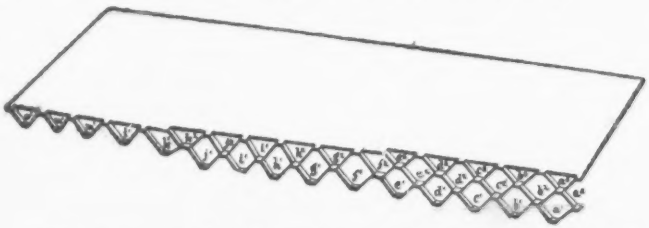
As the blank is fed forward the corner passes under the first (rearmost) cutter, which acts to simultaneously cut, bend and stretch the strands of the first row of half meshes along the edge of the metal as shown in the following Fig.



As these half meshes are made by a rotary cutter they are not finished at the same time, but successively, the strand a^1 being first cut, bent and stretched and then the strands b^1, c^1, d^1 and e^1 in succession. As the blank continues to travel forward that portion of it, which is at the front end, immediately back of the part that has just been cut, now comes under the second cutter, which acts, in identically the same manner as the first cutter, to simultaneously cut, bend and stretch the strand of the second row of half meshes a^2, b^2, c^2, d^2, e^2, f^2, along the uncut edge of the metal back of the portions left unsevered when the half meshes a^1 b^1 c^1 d^1 *and* e^1 were formed, and in alternate positions. At the same time the first cutter continues to operate and forms the strands f^1 g^1 h^1 i^1 and j^1 in the first row. This is shown in the following Fig.

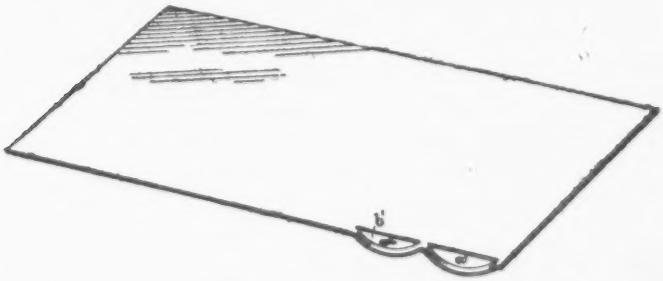


As the blank continues to travel further forward the portion at the front end immediately back of the cut portion a^2 b^2 c^2, &c. now passes under the third cutter, which acts, in identically the same way as the first and second cutters, to simultaneously cut, bend and stretch the strands in the third row of half meshes a^3 b^3 c^3 d^3 and e^3. These half meshes are formed along the uncut edges of the metal back of the portions left unsevered when the half meshes a^2 b^2 c^2 d^2 e^2 and f^2 were formed and in alternate positions. At the same time the second cutter forms the additional strands g^2 h^2 i^2 j^2 and k^2 in the second row, and the first cutter forms the additional strands k^1 l^1 m^1 n^1 and o^1 in the first row. This is shown in the following Fig.

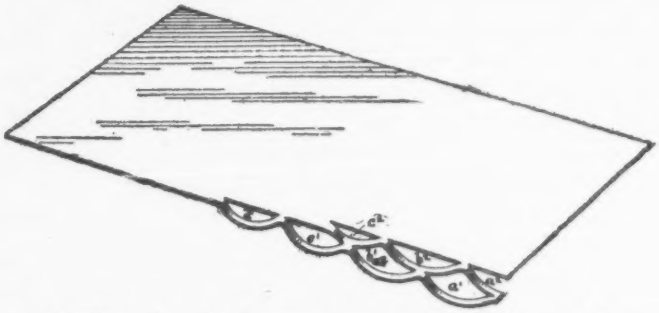


These operations continue until the entire blank passes under all the cutters, each row of half meshes being formed by a separate cutter. The complete meshes are formed by the combination of these half meshes, and the half meshes in succeeding rows are made after the half meshes of the preceding row with which they combine. The illustrations given in the

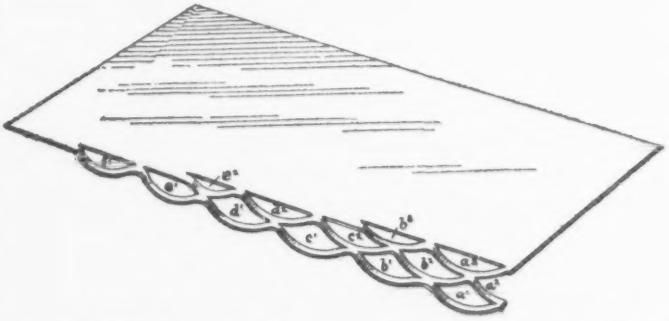
preceding Figs. follow Bradford's patent 664,397 (B. p. 95), which, according to the testimony, shows the machine by which the infringing metal was made. It will be noted that five half meshes or strands (a^1, &c.) were completed in the first row before any strands (a^2, &c.) of the second row were made. The formation of this particular number is due to the number of cutting projections, each of which forms a complete half mesh or strand, on the cutters. If less cutting projections are used, the number of strands that will be cut in each row, before the co-acting strands are formed in the next row, will be less, and in the samples of the Bradford metal which have been produced two strands are made on the first row before the second cutter begins to make the co-acting strands of the second row. This is illustrated in the following Fig.:



When the second cutter comes into action, it forms the strands a^2 b^2 c^2 in the second row at the uncut edge in alternate positions to the strands a^1 b^1, so that they co-act with these previously formed strands a^1 b^1 to form two complete meshes. At the same time the first cutter forms the additional strands c^1 d^1 in the first row. The strand c^2 is only partially cut, this being due to the alternate positions of the cutting projections in the first and second cutters. The condition of the metal at this moment is shown in the following Fig.:



When the third cutter comes into action, it forms the strands a^3 b^3 in the third row at the uncut edge and in alternate positions to the previously formed strands $a^2b^2c^2$ of the second row, and these strands a^3 b^3 co-act with the strands a^2 b^2 c^2 to form full meshes in the second row. At the same time the second cutter completes the strand c^2, forms the additional strands d^2 and partially forms the strand e^2. These strands c^2, d^2 and e^2 combine with the previously formed strands c^1 and d^1 to make two more complete meshes in the first row, and at the same time the first cutter makes two new strands e^1 and f^1 in the first row. This is illustrated in the following Fig.



This is exactly the sequence and combination of operations described in the complainant's patent. The first step is that of "simultaneously slitting and bend-

"ing portions of a plate or sheet of metal in such man-
"ner as to stretch or elongate the bars connecting the
"slit portions and body of the sheet or plate." That step is performed in the making of any of the strands or half meshes a^1 b^1, &c. The second step is that of "similarly slitting and bending in places alternate to the first mentioned portions." That step is performed in the making of the strands or half meshes of any succeeding row as a^2, b^2, &c. And these two steps are so combined that they result in "producing the finished "expanded sheet metal of the same length as that of "the original sheet or plate, substantially as de-"scribed" in the patent. The process is the same throughout. The combination between the strands or half meshes a^3, b^3, and a^2, b^2, &c., is the same as that between a^2, b^2 and a^1, b^1, &c. The strands are "in "every case made back of the portions left unsevered "at the preceding operation."

While in the practice of the process illustrated in the patent and referred to p. 64 *post* all the strands or half meshes in any row are made simultaneously, and the defendants in the Bradford case make them successively, this does not affect the manner in which each strand or half mesh is formed, or the sequence or order in which they are formed, or the manner in which they are combined to produce the whole meshes and expand the metal. The process of the patent relates to this sequence and combination of operations for the purpose of producing the result, and, in these respects, the practice of the defendants in the Bradford case is the same as that described in the patent and followed by the complainant's licensees and by the defendants in the General Fireproofing case; and this identity, as has been pointed out, is admitted by the defendants' expert (Coombs, XQ. 81 B., p. 154).

At the argument in the Court of Appeals defendant's counsel in the Bradford case attempted to deny

infringement on the ground that the claim of the patent is limited to a process in which all of the cuts in each row are made *simultaneously*. The word simultaneously used in the claim does not refer to the synchronism of the making of the cuts in any row, but to the synchronism of the acts of cutting, bending and stretching in each strand. By the first method the strands were cut and then bent. The operations were not simultaneous. In the Golding and Durkee process the strands were simultaneously cut and bent but there was no elongation. In the process of the patent in suit the strands are simultaneously cut and bent, and those simultaneous operations are performed "in such manner as to stretch or elongate the bars connecting the slit portions and body of the sheet or plate." It would seem clear that the word "simultaneously" refers to the synchronism of these operations in making each strand or half mesh and not to the synchronism of making all the half meshes or strands in the same row.

The acts of cutting, bending and stretching each strand must be simultaneous; that is essential to the invention; but whether those operations be simultaneous or successive in the different strands or half meshes in each row is immaterial, and does not affect the result.

Defendant's counsel have also attempted to establish a similarity between the process as practiced by Bradford and the Golding and Durkee process of patent 320,242, because the metal blank is fed diagonally. This diagonal feed is used, because Bradford employed rotary cutters, in order to bring the cutters into action successively, so that each cutter will form its own row of strands or half meshes, and the strands or half meshes in successive rows will be made after the strands or meshes in the preceding row with which they combine to form the complete meshes. In order

that the cuts or strands in alternate positions may thus combine with one another it is necessary that they shall be made by successive operations. Referring back again to the Figs. on p. 56 *ante*, the cuts, strands or half meshes a^2 b^2 c^2 are made by a subsequent and successive operation to that which makes the cuts a^1, b^1, c^1, and the cuts or strands a^3, b^3, c^3 must be made after the cuts a^2, b^2, c^2. The cuts or strands a^1, a^2, a^3 or b^1, b^2, b^3, &c., which are the successive cuts in alternate positions, are made successively. It is the diagonal feed which permits this with the rotary cutters. In the Golding & Durkee process, the diagonal feed is for a different purpose. In this case the successive cuts or strands in alternate positions must be made simultaneously. Referring for example, to Fig. 7, on p. 21 *ante*, the cuts a^1, b^1, c^1 and d^1, which are in the same row, are made successively, but the cuts b^1, b^2, b^3 or c^1, c^2, c^3, c^4 and c^5, which are the successive cuts in alternate positions, are made simultaneously. In the Golding & Durkee process it is the diagonal feed which enables this to be accomplished. The fact therefore that the blank is fed diagonally by Bradford during the operation of forming the half meshes does not make that process similar to the old Golding & Durkee process. The essential difference is that in the patented process the strands in alternate positions must be made by successive operations to produce the combination of the half meshes and make the whole mesh by two operations, while in the Golding & Durkee process the strands in alternate positions must be made simultaneously, to enable the whole mesh to be formed by one operation. This difference is discussed more at length, p. 64 *post*.

THE NOVELTY OF COMPLAINANT'S PROCESS.

So far as it relates specifically to the making of expanded metal the prior art has already been referred to at considerable length.

The I. Kenny patent, 312,864, and the Engstrom patent, 385,663, have also been referred to by defendant's expert, Gunz, in the General Fireproof case (XQ. 60, G. F. P., p. 165), but they are not seriously pressed and need not be considered.

In addition to the patents relating to expanded metal, a number of patents relating to unexpanded metal lathing have been offered (G. F. P., p. 168). It will not be necessary to refer to all of these, as it is agreed by defendant's expert, Gunz (XQ. 67, G. F. P., p. 166), that the Ohl patent, 475,700 (p. 493), may be taken as representative of the class.

The prior art to be considered, therefore, may be classified as follows:

1. The original crude idea of expanding metal, disclosed in Long's British provisional specification 2,125, of 1862, the Golding patents 297,382 and 320,240, and Johnson's British patent, 11,332, of 1885.

2. The first practical method of expanding metal commercially, disclosed in the Golding and Durkee process patent, 320,242.

3. The method of making unexpanded metallic lathing disclosed in various patents, of which Ohl's patent, 475,700, may be taken as representative of the class.

The first question touching the validity of complainant's patent is whether the improvement described and claimed therein was a new and useful improvement over this art, and whether its production required an exercise of the inventive faculties.

It may not be out of place here to call the attention of the Court to the fact that it was exactly this prior art that was considered by the Patent Office during the prosecution of the Golding application, and that the claim which now appears in the patent was drawn by the Patent Office Examiner as defining the new and patentable invention which Golding had made over this art. This is not a case where something new is called to the attention of the Court, which might possibly have been overlooked by the Patent Office; it is a case where the Court is asked to decide, on the identical art that was considered by the Patent Office, that the decision of the Patent Office was wrong.

1. The Original Idea of Expanding Metal.

We have shown (p. 13, *ante*), that the first suggestion for expanding sheet metal involved two separate and independent operations. The sheet was first cut with rows of alternately disposed slits throughout the entire body, and was then expanded by a separate, subsequent operation, either by pulling the edges of the sheet laterally, as in the Long, Johnson and first Golding patents, or by bending the strands down transversely to the plane of the sheet, as in the second Golding patent, 320,240. We have shown that this method was commercially impracticable and that metal was never expanded successfully, *i. e.*, commercially, by it.

2. The Golding & Durkee Process of Patent 320,242.

We have shown (p. 17 *ante*) that under this process the strands were simultaneously cut and bent into the full mesh or opening, this bending being permitted by reason of the fact that the cutting was performed in stepped lines or rows, whereby the ends of the meshes were severed from the body of the sheet before being bent.

We have also shown (page 30 *ante*) that this process of expanding metal resulted in the production of

an unsatisfactory and imperfect product, which was greatly limited in its adaptability for commercial uses.

It is suggested that in the Golding & Durkee process the strands are stretched to some extent during the operation of cutting and opening the meshes, that the extent of stretching is one of degree only, dependent upon the form of the cutters used, and that as the Golding & Durkee patent shows the making of the cuts in alternate positions to the previous cuts, no invention was involved in the process of the patent in suit—the new process consisting merely in the use of a different form of cutters, and the repetition of the steps in alternate positions being old.

The fallacy of this suggestion will become apparent upon an analysis of the operations performed in the Golding & Durkee process. In the first place the successive cuts are not made in alternate positions to the previous cuts in successive operations, as in the process of the patent in suit, but are made *simultaneously in alternate positions* and must be so made to produce the result of making the full meshes. Referring, for example, to Fig. 5 of the illustrations of the Golding & Durkee process (p. 20 *ante*), it will be noted that the cuts b^1, b^2, b^3 are made simultaneously, at one operation, and the cuts c^1, c^2, c^3, c^4 and c^5 simultaneously at another operation, but it is the row of cuts c^2, b^2, that are in alternate positions behind the cuts c^1, b^1 and a^1 and the cuts c^3, b^3 that are in alternate position behind the cuts c^2 and b^2. According to the process of the patent in suit the cuts c^1, b^1 and a^1 would be made, and then, by a separate and subsequent operation, the cuts c^2 and b^2 would be made in alternate positions back of the cuts c^1, b^1 and a^1, and by the next operation the cuts c^3 and b^3 would be made in alternate positions back of the cuts c^2 and b^2. And this is the same whether the cuts be made in straight lines entirely across the length of the sheet, as is shown in

the patent, and as they are made by the defendant, The General Fireproofing Co., or whether they are made with a diagonal feed by means of rotary cutters as is in the Bradford case (see p. 54 *ante*).

In other words, the difference in the manner of cutting is this: In the Golding & Durkee process the cuts in alternate positions are made *simultaneously;* in the process of the patent in suit they must be made by separate operations. Referring again to Fig. 5 (p. 20) it will be seen that the cut b^2 is in alternate position to the cut b^1 and the cut b^3 in alternate position to the cut b^2. In the Golding & Durkee process these cuts *must be made simultaneously;* in the process of the patent in suit they must be made at different operations. So that we see that in the Golding & Durkee patent we have not the same *order of cutting* as in the process of the patent in suit, and this order of cutting is essential. The process consists, not in the manner of making any cut—not in the use of any particular kind of cutters—but in the particular order in which the cuts are made. In the Golding & Durkee process the overlapping cuts, as b^1, b^2, b^3, or c^1, c^2, c^3, c^4 and c^5, must be made at the same operation; it is this *order of cutting* that enables the strands to be bent out into the full mesh; it is the essential characteristic of the Golding & Durkee process; in the process of the patent in suit these overlapping cuts must be made at subsequent operations, it is this different order of cutting that enables the half meshes to be made at each operation, and requires two operations to produce each full mesh.

Not only is the order of cutting different in the two processes, but the manner of cutting also. It is essential to the Golding and Durkee process that the metal which forms the outer ends of the strands of any mesh shall be severed from the sheet in widths *equal to the width of two finished strands,* and that

this double width of metal shall be split by the action of the cutters while it is partially free from the main body of the uncut sheet and when carried down below the plane of the sheet. It is this that enables the strands to contract endwise and bend open to form the complete mesh.

In the process of the patent in suit the metal cut at each operation is only the exact width of the strand; this is not severed at one end and split, but is bent down and stretched in a half mesh while both of its ends are attached to the uncut body of the sheet.

The process of the patent in suit requires two operations to produce a complete opening or mesh, while the Golding and Durkee process requires but one. This is a sacrifice of speed, it is true, but it is by reason of this sacrifice of speed that the greatly improved results are obtained.

Again, as to the stretching of the strands in the Golding & Durkee process: when any piece of metal is cut between shears there is a slight elongation of the cut strip. This may readily be observed by cutting a piece of tin with a pair of scissors; this elongation is very little in degree, and practically amounts to nothing. It is only such stretching that takes place in the Golding & Durkee process. Stretching or elongation to any substantial extent can be obtained only when both ends of the stretched strands are connected with the body of the plate. It is essential to the Golding & Durkee process that the outer ends of the strand shall be severed from the body of the plate, it is this that enables the strand to be bent into the full mesh and at the same time prevents any appreciable stretching.

The differences between the Golding & Durkee process and the process of the patent in suit are fundamental. There is not merely a difference in the manner of making the isolated cuts depending upon

the shape of the cutters, but a difference in the order of making the cuts, in their relation to one another. The process of the patent in suit does not consist, as the defendant's counsel have suggested, in using a different form of cutters and proceeding to cut in the manner, order or sequence of the Golding & Durkee process; but in cutting in a different manner, order or sequence, irrespective of the form of the cutters. It is this particular order or sequence of making the cuts that results in the combination of the successive operations to produce a complete mesh or opening. It is this order or sequence that distinguishes the patented process, not only from the prior Golding & Durkee process, but from the method of making lathing, such as is shown in the Ohl patent.

3. The Making of Metallic Lathing Illustrated in the Ohl Patent, 475,700, and Other Patents of the Class.

The Ohl patent describes a machine for making metallic lathing, *i. e.*, thin metal sheets which are fastened to the frame work on walls and ceilings in place of ordinary wooden laths to hold plaster.

Material of this kind has been used for many years, and is made in a great variety of forms; in some cases it is woven wire, in others, perforated sheets. It is to the latter class that the Ohl patent relates. Not only is it necessary that the sheet shall be perforated to provide holes through which the plaster may pass, so that it will be held on the surface of the sheet, but it is also necessary that there shall be protuberances or projections on the back of the sheet, so that the body will lie in planes offset from the surface to which the sheet is attached, thus affording sufficient space on the inside for the plaster to pass through the holes and become secured or keyed, just as in the case of wooden lathing, where the laths are separated a slight distance from one another, and the laths are offset from the frames, when necessary, by small blocks.

Expanded metal, in its smaller sizes, is used as metallic lathing, just as woven wire is so used, but obviously this refers only to a possible similarity of use, not to an identity of construction, or to a similarity in the methods of production. The essential difference between expanded metal and metallic lathing of the character shown in the Ohl patent, and the other patents of the class, is that the former is metal which has been expanded in area—it is a large open meshed sheet formed by enlarging, or greatly widening a narrow plate or sheet of metal—while the latter is not expanded at all; it has holes or protuberances punched in it, but the finished sheet is of the same length and breadth as the original blank.

The Ohl patent describes a machine for making such non-expanded metal lathing. A thin sheet of metal is passed between rollers having dies and punches, by which strips are punched, or cut, bent and stretched at intervals in the body of the sheet to form a series of loops or strips S^1 distributed at intervals over the area of the sheet. The openings formed by the punching of these loops provide the holes through which the plaster may pass and become keyed or secured, and the loops form the offsetting means or projections by which the sheet, when attached to the framework, is offset. There is no expansion or widening of the sheet; it is exactly the same width when finished that it was before.

It is true that loops S^1 in the Ohl patent are stretched, to some extent, when they are cut and bent, and it is undoubtedly for this reason that the patent is urged. It is said that this patent discloses the idea of simultaneously cutting, bending and stretching loops in a sheet of metal, and that therefore there was no novelty in the complainant's patent in simultaneously cutting, bending and stretching loops. We do not deny that this patent, as well as others which have been

cited, disclose the idea of simultaneously cutting, bending and stretching metal strands, and we admit that that single step or operation was not new with the patentee; but his invention, his idea of means, does not consist in this step, or in the repetition of that step, but in a certain combination of such steps in such relation to one another and to the material acted upon **that they result in expanding the metal** at the same time that they cut, bend and stretch the individual strands. It is just here that the Circuit Court of Appeals, for the Third Circuit, fell into error. That Court seems to have supposed that Golding's improvement consisted in the act of simultaneously cutting, bending and stretching strands. Manifestly, however, such was not the fact, for that step was shown in the Ohl patent, and was known to be old to the Examiner when he drew the patentee's claim. The invention consisted not in this operation, not in a mere repetition of this operation, but in the **combination** of a series of such operations in a certain manner to produce the desired result. It was this combination of these operations which constituted a series of steps performed upon a sheet of metal to expand it in a new and better way and to produce a better and more useful product.

THE PROCESS DESCRIBED IN THE OHL PATENT IS NOT A PROCESS OF EXPANDING METAL; METAL CANNOT BE EXPANDED IN THAT MANNER, AND THE MACHINE DESCRIBED IN THE PATENT IS INCAPABLE OF BEING USED FOR THE PURPOSE OF EXPANDING METAL.

A sample of Ohl lathing has been offered by complainant (G. F. P., p. 75), Complainant's Exhibit No. 21 "Sample Ohl-Bostwick Lathing." It will be seen

that the sheet is not expanded or widened to any extent; loops are stamped up but there is no expansion of the sheet.

Defendant's expert, Gunz, attempted to show that metal could be expanded by the Ohl machine, or by the methods described in the Ohl patent, and he produced a sample, part of which was expanded in a manner similar to that described in Complainant's patent, but on cross-examination (XQ.'s 70-85, G. F. P., pp. 167-171) he was compelled to admit that he did not use a machine similar to that shown in the Ohl patent, or operate it in a similar manner. And finally he admitted (XQ. 85, G. F. P., p. 171):

> "It would not be possible to make successfully any other design of lathing than that for which the machine was designed and built, because this particular machine would be used improperly if another design was made."

And in answer to XQ. 79 (p. 169), he says:

> "I have already pointed out that I do not know of any machine excepting Mr. Golding's which was designed for the particular purpose of making sheet metal in this particular manner, that is, according to this particular design; I mean expanded metal in which the process of the patent in suit is carried out."

And defendant's expert, Kennedy, testifies to the same effect (G. F. P., p. 206):

> "XQ. 35. And is it possible, following the Ohl patent, to so alternate these rows of loops S[1] that the production of each succeeding row after the first will result in the formation of strands which with the row of loops previously formed will produce completed meshes?
>
> "A. No, the Ohl machine did not do this.
>
> "XQ. 36. And could not do it?
>
> "A. No."

It is perfectly obvious from an examination of the Ohl patent, not only because of the character of the machine, but because of the nature of the article to be produced, that the rows of loops S^1 must be formed independently and separated from one another by an intermediate uncut strip. There must not be, and cannot be, any possible combination in the cutting of successive rows of loops, as is essential to the production of expanded metal. There must not be any such combination, because the metal desired—the form of lathing shown and exhibited in the sample Exhibit No. 21—would not then be produced; there cannot be any such combination, because any attempt to so combine successive operations would result merely in cutting the sheet into separate corrugated strips. This is explained by Mr. Golding (RDQ. 243, G. F. P., p. 114):

> "The cutting of the second row of loops has "nothing whatever to do with the cutting of the "first row of loops, as it is distant from such first "row of loops, and if it were not distant from the "first row of loops the entire sheet would be cut "up into distinct and separate strips."

And Mr. R. M. Hunter testifies to the same effect (Q. 17, G. F. P., p. 75):

It is perfectly clear that the Ohl patent does not disclose the Golding process of making expanded metal, or any process of making such metal, and that metal cannot be expanded by any method or process disclosed in the patent. The patent shows that metal loops or strands can be simultaneously cut, bent and stretched, and nothing more than that.

THE METHOD DESCRIBED AND CLAIMED IN THE PATENT IN SUIT IS NEW AND USEFUL.

Nothing in the prior art shows a method of expanding metal by the combination of the steps or acts

described and claimed in the complainant's patent; the performance of those acts was novel; it is conclusively shown that it was an improvement of exceptional utility. Why then should it be held unpatentable?

There are three requisites to patentability—novelty, utility, and "invention;" the first two are undoubtedly present; if the third is absent it must be because there is something in the nature of the improvement which renders it incapable of protection as an invention. This is the defense in these cases, and it was the basis of the decision of the Court of Appeals, for the Third Circuit, in the Bradford case.

That decision is apparently based upon the supposed authority of the opinion of this Court in *Risdon Iron and Locomotive Works* v. *Medart,* 158 U. S. 68, but there is also a reference to *Burr* v. *Duryee,* 1 Wall. 532, and *O'Reilly* v. *Morse,* 15 How. 62, and it may have been based upon these cases.

The principles involved in the first case and in the two latter cases are very different. The former concerns the patentability of processes, which do not involve chemical reactions or elemental changes, the latter case the patentability of "principles."

Whichever may have been the basis of the decision of the Court of Appeals in the Bradford case, we are convinced that it arose wholly from a failure to understand the patentee's invention or a misapprehension of it, and a resulting misapplication of the principles of these cases to the patent.

We think that this misunderstanding will become apparent to this Court upon an attempt to apply the reasoning of the opinion in the Bradford case to the facts presented by the evidence.

The Court of Appeals, for the Sixth Circuit, in the General Fireproofing case, in refusing to follow this decision, say (G. F. P., p. 449):

"On this appeal much reliance is placed by the appellee upon the decision in that case, and rightly so, for this Court would be strongly inclined to follow a decision of that learned Court, if made of the same questions and upon the same record as presented in the case before us. The question of the validity of the patent is the same; but we have no means of knowing what evidence was adduced in the case in the Third Circuit and so are unable to determine to what extent, if at all, our duty to follow that Court should constrain us. At all events, our impressions upon the questions involved are so strong that we feel compelled to express an independent judgment."

THE COMPLAINANT'S PROCESS IS FOR A TRUE COMBINATION OF OPERATIONS TO PRODUCE A NEW RESULT.

In explaining the invention the Court of Appeals, for the Third Circuit, in the Bradford case states (B., p. 245):

"The subject of the invention, as declared in "the specification, is a 'new and useful improve-" 'ment in the art of expanding sheet metal;' and "the precise improvement which the applicant as-"serted that he had made was the simultaneous "cutting and opening or expanding the metal at "the cuts by stretching the severed portions. In "other words, he applied for a patent upon a "method of manufacture, and as will appear from "the specification, which we are about to quote, **"he distinctly limited the novelty of his method "to the stretching of the severed portions at the "time when the metal was cut and the slits were "opened."**

It would appear that what that Court understood to be the precise improvement claimed by the patentee was the "simultaneous cutting and expanding the

metal at the cuts by *stretching the severed portions.*"

The Court very properly refused to sustain a patent for this act of simultaneously cutting, bending and stretching metal strands, and very properly decided that such an act involves nothing more than an abstract idea, which cannot be made the subject of exclusive appropriation. If this was what the patentee claimed, we would not question the soundness of the Court's decision. We concede, not only that the simultaneous cutting, bending and stretching of the metal strands is a mechanical act that cannot be made the subject of a patent, but also that it was an act which was well known and practiced in metal working. It is shown for example in the Ohl patent 475,700.

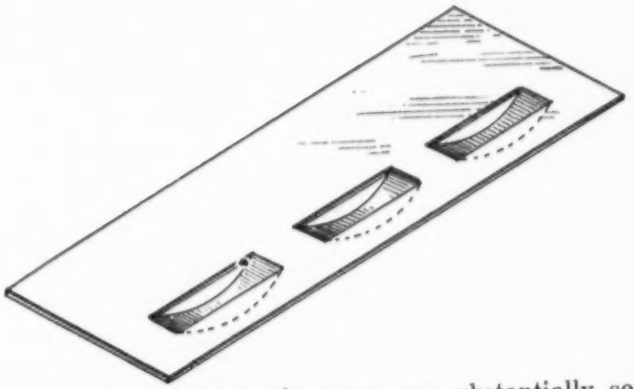
But the patentee does not claim a patent for this act of simultaneously cutting, bending and stretching metal strands. In that there was neither novelty nor patentable process.

The process consists in simultaneously cutting, bending and stretching metal strands, and **then again** simultaneously cutting, bending and stretching other strands, **the two acts being performed in such relation to one another and to the metal acted upon that they co-act to produce a result, due to their peculiar combination.**

The act of simultaneously cutting, bending and stretching metal strands does not produce expanded metal, nor does the repetition of that act produce such metal. It is only when the two acts are so performed with relation to one another and to the metal acted upon that their separate results coalesce, as it were, and combine together to produce a unitary result.

The act of simultaneously cutting, bending and stretching metal strands in a sheet of metal results in the formation of bent strands extending below the plane of the sheet and leaving openings in the body.

This is illustrated in the following view:

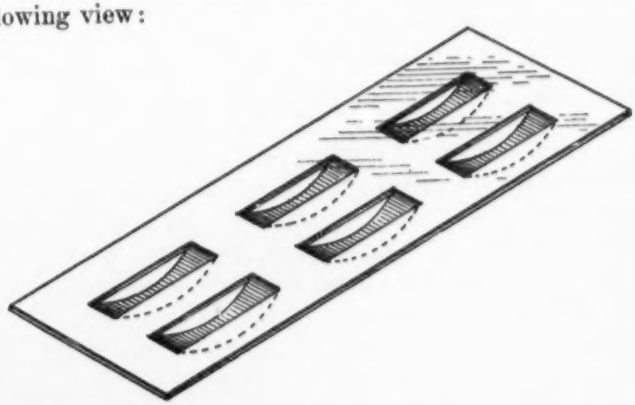


And the result is the same, or substantially so, whether such strands be cut and stretched in the body of the sheet, as in the above view, or at the edge as shown below.

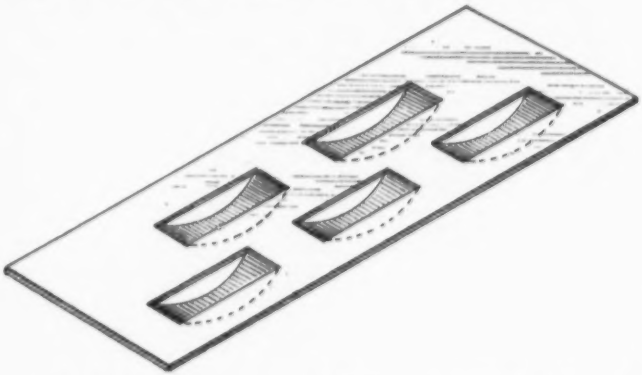


Manifestly this step of simultaneously cutting, bending and stretching strands does not produce expanded metal. It merely results in punching down stretched *loops* or strands.

Nor will the mere repetition of this act produce expanded metal. We will then have merely a series of rows of such loops. This is illustrated in the following view:



And it does not matter whether the strands in succeeding rows are cut, bent and stretched in line with one another, as in the above view, or in alternate positions, as in the following view:



If the Court will refer to Ohl's patent it will be seen that this is exactly what is shown in that patent. It is also shown in the Elkins' patent 408,599; and is exhibited very clearly in the sample of the Ohl-Bostwick lathing G. F. P. "Complainant's Exhibit No. 21."

We have here metal which has been treated by the performance of this act of simultaneously cutting, bending and stretching strands in a metal sheet. The act has been repeated and the strands have been formed in alternate positions; yet it is clear that expanded metal has not been produced. The sheet still has its original length and breadth; it has not been expanded or enlarged in area but merely changed in superficies.

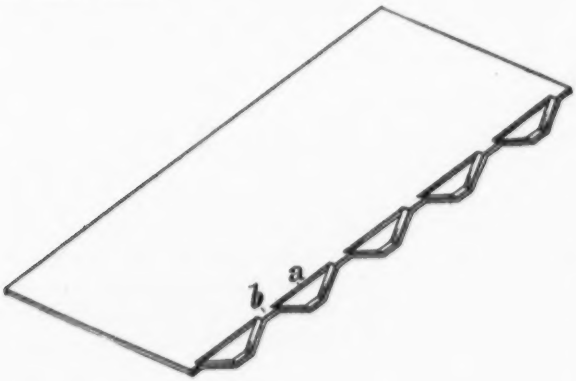
It follows, therefore, that the mere act of simultaneously cutting, bending and stretching metal strands does not produce expanded metal, nor the mere repetition of that act, nor does the mere alternation of the positions of the strands in successive rows. We have all of those operations and arrangements in the Ohl lathing.

Why is it then that the performance of these operations does not result in expanding the metal? *It is simply because there is no co-operation between the successive steps.* Each step of cutting, bending and stretching a row of strands, is independent of the others, it does not affect or qualify any of the others, it does not co-act with other steps to produce a result due to combined action.

Here we have a series of separate independent operations each complete in itself.

To produce expanded metal something more is necessary. The successive steps of cutting, bending and stretching the strands must be performed in such relation to one another and to the metal acted upon that they will co-act, and that the result produced will not be a series of independent results, each due to the performance of a single act, but a different result due to the combined results of successive acts.

The first step of simultaneously cutting, bending and stretching strands, in the production of expanded metal, does not differ in its results from any of the separate steps above referred to. It merely produces stretched loops or strands struck down from the plane of the sheet thus:



The metal is not yet expanded. There is merely formed a row of loops or strands.

Expanded metal is made up of open meshes bounded on all sides by strands. This first step produces but a half-mesh, bounded by strands on one side only. To produce the complete mesh the second step must be performed, but it must be so performed that it will produce the intended result. The mere repetition of the operation, as in the Ohl patent above referred to, will not produce the result. It is necessary that the second act of cutting, bending and stretching shall be performed *at the uncut edge of the metal and in position alternate to the performance* of the first act. This is described in the patent in ll. 34-47:

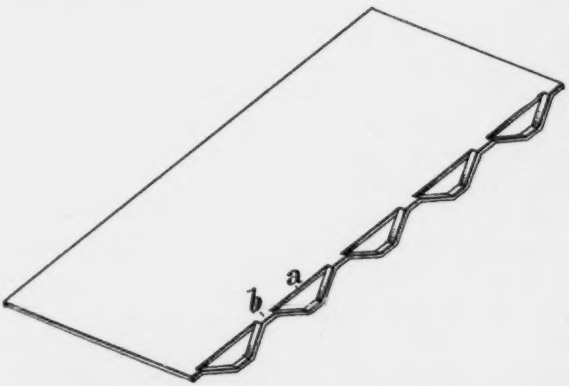
> "In the practice of my invention I prefer to "make a series of slits in a straight line **across the "edge of the sheet,** and at the time of cutting the "slits and as a continuation of that operation to "depress or stretch the severed metal, *i. e.,* **those "portions of the sheet lying outside of the cuts,** "in a direction at right angles to the sheet, with- "out any contraction from the length of the origi- "nal sheet. **This operation is then repeated after "the sheet has been fed forward,** the slits being "made opposite the portions unsevered at the pre- "vious operation, and so on until the entire sheet "is expanded."

And in lines 90-98:

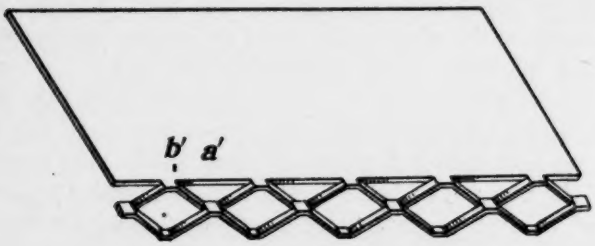
> "One line of slits across the sheet is formed "at each operation, and the upper cutters, or the "sheet may be shifted and the sheet be fed for- "ward between the operations so that the slits are "in every **case made back of the portions left un- "severed at the preceding operation,** or in other "words, the slits and unsevered portions alternate "in position at successive operations."

To make expanded metal, the first step is performed at the edge of the sheet to depress and stretch those portions lying outside of the cuts, *i. e.,* the strands, and the second step must be similarly performed *at the new edge* thus created to *similarly* depress and stretch those portions of metal lying outside of the new cut or line of cuts, *i. e.,* the second strands, and it must be performed at a point alternate to the first step, so that the slits in every case will be made back of the portions left unsevered at the previous operation.

We have seen that the first step merely cut, bent and stretched the strands, forming the loop or half mesh, or row of loops or half meshes, at the edge of the sheet, thus:

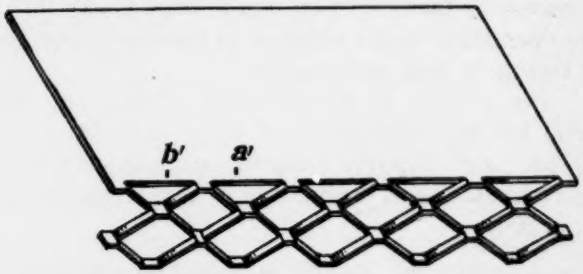


The second step is performed at the new edge *a* and the metal is similarly cut, bent and stretched, but the slits are made at the points *b* "*back of the portions left unsevered at the preceding operation,*" with the result that, as the new loops or half meshes, are thus formed, the metal at the tops (b) of the previously formed loops is severed *and pushed down* as shown in the following view:



This cutting away and pushing down of the metal at the points *b* resulting from the second operation, caused the first loop to be moved away from the body of the sheet and a new edge a^1 is formed, upon which the next step is performed, as before, at points alternate to the last. The second operation is exactly similar to the first operation so far as concerns the cutting, bending and stretching, but, by reason of the fact that it is performed at the edge of the metal and back of the portions left unsevered at the preceding operation, it not only cuts away and pushes down the upper portions or angles (b) of the first loops or half meshes, but by the creation of a second set of loops or strands furnishes the strands necessary to make the completed mesh. Thus, the metal is "expanded," and the expansion is produced, not by either operation of cutting, bending and stretching the strands alone, but by the co-action of the two in the particular manner described. These two operations, performed in any other relation to one another and to the sheet acted upon would not produce expanded metal.

The third step, performed again in the same relation to the second step, that is *along the edge* and *"back of the portions left unsevered at the preceding operation,"* will push down the points b^1 and expand the metal still further, as shown in the following view:



There was certainly nothing like this known in the prior art of making expanded sheet metal, nor anything to suggest it. It is true that it was known that metal could be simultaneously cut, bent and stretched, but it was not known that the repetition of that act at the edge of the metal in places back of the portions left unsevered at the previous operations would result in the production of expanded metal. It is necessary, to secure the result, that the cuts, together with the bending and stretching, shall be made *at the edge of the metal* and that each succeeding cut (together with the bending and stretching) shall be made back of the portions left unsevered at the previous operation. Without this the result cannot be obtained.

This is the discovery that Golding made and that he describes in his patent. It constitutes a new method of expanding metal, differing materially from the methods previously known and practiced. It consists in the performance of certain operations successively in a certain relation to each previous operation and to the material, by which the successive steps, when so performed, co-act or combine together in the production of a new result.

Golding did not invent or first suggest the separate operations. The operation of simultaneously cutting and bending metal so as to stretch the strand was old. What Golding discovered or invented was **the act**

of repeating that old operation in such a way that the two operations would combine to produce a new result by reason of their combination.

The novelty of this method of thus expanding metal by the combination of these operations is not denied. As compared with the manufacture of Ohl-Bostwick lathing it is admitted by Mr. Kennedy (G. P. F., p. 206):

> "XQ. 35. And is it possible, following the "Ohl patent, to so alternate these rows of loops S[1] "that the production of each succeeding row after "the first will result in the formation of strands "which with the row of loops previously formed "will produce completed meshes?
>
> "A. No, the Ohl machine did not do this.
> "XQ. 36. And could not do it?
> "A. No."

In the prior Golding & Durkee process of patent 320,242, complete meshes or openings were formed at each operation by cutting and bending.

Perhaps in our argument in the Bradford case we emphasized too much the feature of stretching, from which the Court appears to have concluded that in this alone resided the inventive act. Simultaneous cutting and bending was old in the art of expanding metal; but in that method the strands were not stretched; in the new method the strands are simultaneously cut, bent and stretched. The new or added *characteristic* was the stretching, but the *inventive act* did not lie in the mere thought or suggestion that the strands should be stretched at the same time they were cut and bent, as the Court appears to suppose. That idea was old in the cognate art of making metallic lathing by punching up loops in sheets. It has been known for years. There was nothing new, therefore, in the idea of stretching strands *per se*.

An invention does not exist in an abstract thought, but in the practical application of that thought to the accomplishment of a new or better result. The mere thought that the metal might be stretched while it was cut and bent amounted to nothing. It could not be applied to the known methods of making expanded metal, because the method of cutting and bending *prevented stretching*. The metal was so cut that the resistance to bending was removed and consequently the metal strands could not be stretched. To make a practical application of the thought and to enable the characteristic of the stretching to be added or introduced, it was necessary to discover a new manner of performing the operations of cutting and bending—a new relation or sequence of the acts, which differed not only from the relation or sequence of the acts previously performed in expanding metal, without stretching, but also from the relation or sequence of the acts performed in making lathing with stretching. The patentee did not therefore limit

> "the novelty of his method to the stretching of
> "the severed portions at the time when the metal
> "was cut and the slits were opened."

It is true that such was the novel *characteristic* of the metal produced, but what he discovered was the novel manner in which the metal could be simultaneously cut, bent and stretched to introduce that novel characteristic. The inventive act consisted not in the idea of stretching but in the new method of acting on the metal by which stretching was practically applied.

And this discovery was certainly not obvious. The making of expanded metal as a commercial art had existed since 1885; the fact that a metal strand could be simultaneously cut, bent and stretched was known certainly as early as 1889 (Elkins' patent, G. F. P., p.

360), and must have been known much earlier. The production of expanded metal under known methods was unsatisfactory. Those engaged in the business were not succeeding, yet it did not occur to any one that the difficulties could be overcome by applying the known principle of simultaneously cutting, bending and stretching strands to the making of expanded metal.

This is shown, particularly by the statement in the Golding and Durkee patent of 1885:

> "It is evident that the meshes could not be "cut and simultaneously formed if the cuts were "made in single direct lines across the metal, for "the reason that as the meshes are made the "article which they form is contracted to a length "less than the original length of the metal from "which it is cut."

It certainly must have been known to Golding and Durkee, at that time, or to anyone familiar with the art of metal working, that metal could be simultaneously cut, bent and stretched; any metal punching or stamping machine did that. But it was not known that that operation could be applied to the making of expanded metal, because its application was not obvious and did not lie within the skill of the calling. And it did not lie within the skill of the calling because that operation was available for the production of expanded metal only when it was applied in a certain manner. It was this manner of applying that known operation that Golding discovered and in which his invention consists.

To make expanded metal by this operation it was necessary not only to simultaneously cut, bend and stretch the strand, but also to *expand the metal sheet.* The world knew how to do the first; Golding told it how to do both.

IF GOLDING'S IMPROVEMENT WAS NOTHING MORE THAN THE IDEA OF SIMULTANEOUSLY CUTTING, BENDING AND STRETCHING STRANDS IT WAS ANTICIPATED BY THE OHL PATENT.

The Court of Appeals for the Third Circuit has said that the Bradford case was "close", and has conceded that Golding's improvement was a "happy thought". If, as the Court says Golding limited

> "the novelty of his method to the stretching of the "severed portions at the time when the metal was "cut and the slits were opened",

it was not a "happy thought", and the case could not have been "close", because that idea was clearly disclosed in the prior Ohl patent, which was cited by the Examiner, who drew the patentee's claim in his own words, for the very purpose of distinguishing the invention from that patent. Perhaps the Court was influenced by a too literal interpretation of the claim.

A patentee is, of course, bound by his claim, which is intended to particularly point out those features wherein the invention consists and to distinguish them from that which is old.

The claim, which is thus made by the patentee is to be the measure of the extent of his monopoly, but it is to be construed liberally. If there is any doubt as to its meaning, recourse must be had to the specification to interpret it.

We must remember that the underlying theory of our patent laws—the only justification for the grant of patent rights—is that, in consideration of an inventor making his invention known, he is to have governmental protection in the exclusive enjoyment of his invention for a limited time. The Federal Courts constitute that portion of the Government to which is

delegated the duty of carrying out this arrangement, and it is unjust to the inventor, who has complied with his part of the contract, by making his invention known, if the Courts, as the representative of the Government designated for this purpose, fail to fulfill their part of the contract on behalf of the Government. It is the duty of the Court, in interpreting the claim of any patent, to so interpret it as to give to the patentee, if possible, the full protection to which he is entitled, in return for the disclosure he has made.

The claims of a patent are not to be construed against the patentee, on the theory that because he selected those words to express the limitations of his invention he must be strictly bound to them. Such a rule of interpretation cannot be justly applied to patents granted under our system, because the terms of the claims are not the mere expression of the patentee's ideas of the scope and limits of his invention. Under our system of regulating the grant of patents, we have established an elaborate examining board of experts, to pass upon the language of the claims and description, and required by law to allow those claims only that meet with their approval.

It is true that ordinarily the wording of a claim is chosen by the patentee, or his attorney, and is merely approved by the examining expert; but this patent is, in this respect, exceptional, in that the **particular wording of the claim was not that chosen by the patentee to describe his invention, but that selected by the Government.**

A reference to the proceedings in the Patent Office leading up to the grant of the patent (G. F. P., p. 125-134) discloses that originally the patentee claimed broadly the improvement in the art of making expanded metal

> "consisting in simultaneously slitting the sheet "and stretching the severed portions." (p. 128.)

This was clearly a claim to the operation of "simultaneous cutting and opening or expanding, "the metal at the cuts by stretching the severed "portions."

The opening or expanding was not specifically mentioned. This claim was very properly rejected on the Ohl patent, (p. 129). It was merely a claim to the principle or idea of applying to the art of expanding sheet metal the known operation of "simultaneous cutting and expanding metal at the cuts to stretch the severed portions."

It did not contain those statements *as to the repetition of that operation* in a certain relation to previous operations and to the metal acted upon, by which alone the metal could be expanded and in which the invention existed.

Before this rejection, however, the patentee submitted a second claim, in which he sought to introduce these features that were lacking in the original first claim. This claim was as follows (p. 129):

"The herein described method of making open "or reticulated metal work, which consists in "simultaneously slitting and stretching portions of "a plate or sheet of metal away from the plane of "the sheet, and then simultaneously slitting and "stretching away from the plane of the sheet sub-"sequent portions of the sheet in places alternate "to the first mentioned portions, and **by each suc-"cessive slitting and stretching operation forcing "the metal already operated upon further away "from the original plane of the sheet,** substantially "as set forth."

The Examiner, appreciating the novelty and patentability of the invention the patentee was seeking to cover by this second claim, but not approving of its form, suggested a new claim as a substitute, which the patentee accepted (p. 130).

It thus appears that the wording of the claim in the patent was that chosen, not by the patentee, but by the Examiner—the Government's representative—for the purpose of defining the patentee's invention, **and expressly for the purpose of distinguishing it from the prior patent of Ohl,** which disclosed the principle of simultaneously cutting and bending sheet metal so as to stretch the severed strands, and from the prior Golding & Durkee process.

It would seem, therefore, that this claim is exceptionally entitled to a liberal interpretation for the purpose of carrying out the intent of the patentee and the Government's agent in defining the invention and construing the contract created by the patent. If there is anything unhappy in the language selected for the purpose, any difficulty in the way of construction, that defect is not primarily the fault of the patentee, but is due to the act of the Government's agent.

We have pointed out that the production of expanded metal by simultaneously cutting and bending the metal so as to stretch the severed strands does not result merely from the performance of that operation, or the repetition of that operation, or the alternation of that operation, but results only when the successive operations are performed at the edges of the metal and back of the portions left unsevered at the previous operation, so that the successive operations may co-act to press down the angles and thus expand the metal, and it may be said that these steps are not in as many words stated in the claim. The claim which the Examiner suggested and which the patentee accepted is as follows:

> "The herein described method of making open "or reticulated metal work, which consists in "simultaneously slitting and bending portions of a "plate or sheet of metal in such manner as to "stretch or elongate the bars connecting the slit

"portions and body of the sheet or plate, and then
"similarly slitting and bending in places alternate
"to the first mentioned portions, thus producing
"the finished expanded sheet metal of the same
"length as that of the original sheet or plate, sub-
"stantially as described."

It is true that this claim does not in so many words say that these successive steps are to be performed at the edge of the metal and back of the portions left unsevered at the previous operation, but it does contain these limitations in effect, for it says these operations are to be performed "substantially as described," and that their performance substantially as described results in "producing the finished expanded sheet metal of the same length as that of the original sheet or plate."

These operations are clearly stated in the specification. In lines 35-36 it is said that the first strands are to be formed "*across the edge of the sheet.*" The sheet is to be then fed forward and *this operation* is to be repeated (ll. 42-44) and the second strands are to be formed "back of the portions left unsevered at the preceding operation" (ll. 90-96). The second operation is to be performed similarly to the first and must inevitably be performed across the edge of the sheet, as is shown in the drawings. The specification does not, in so many words, state that this second operation results, as it necessarily must, in the forcing or pushing down of the top or angle of the previously formed half mesh, thereby expanding the metal, but that is shown in Fig. 1 of the drawings and it was clearly described in the claim which the patentee proposed (p. 129). In that claim the patentee described this result as follows:

"and by each successive operation forcing the
"metal already operated upon further away from
"the original plane of the sheet, substantially as
"set forth."

It is the opinion of counsel that this claim expressed the patentee's invention better than the claim chosen by the Examiner, but the fact is that both claims were intended to mean the same thing. The Examiner, who, as the Government's agent, has the power to decide, preferred his selection of words, and the applicant accepted his suggestion, but we must recognize the fact that those words, whether well chosen or not, were intended, both by patentee and by the Government, to express the patentee's invention, and to distinguish it from the mere act of simultaneously cutting and bending metal so as to stretch the severed strands, disclosed in the Ohl and Elkins patents.

This must be obvious from the fact that the Ohl patent was before the Examiner, had been cited by him, and that he suggested the claim, which now appears in the patent, for the express purpose of distinguishing the patentee's invention from what is disclosed in that patent.

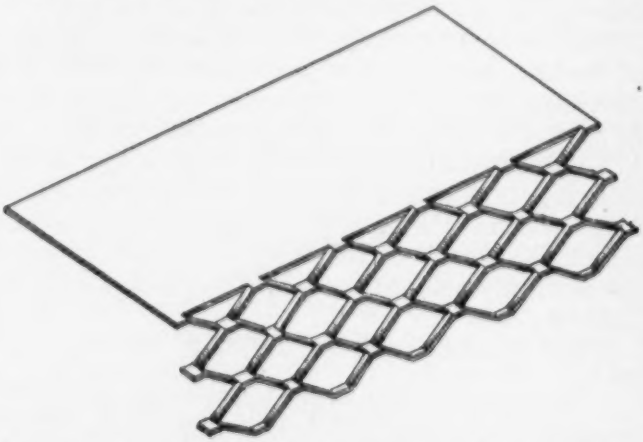
If any claim of doubtful meaning is to be aided by reference to the specification and drawing, especially must this be so when the wording of the claim is that chosen by the Government's agent. Interpreted without reference to the specification or drawing, and disregarding the references to them which the claim contains, the claim can be read directly upon the Ohl patent, but the Examiner suggested the claim for the very purpose of distinguishing from that patent, and we are forced to look to the specification and drawings to explain any difficulty there may be in understanding the meaning, and the claim expressly directs us to do so.

Welsbach Light Co. v. *Cremo Incandescent Light Co.*, 145 Fed. Rep., 521.

There can be no doubt as to the improvement in the art that the patentee made, and the specification and drawing certainly disclose it.

If anything is lacking in the claim, it is a specific statement that the operations of cutting, bending and stretching are to be performed successively at the edge of the metal and back of the portions unsevered by the previous cuts, but these are clearly described in the specification and are shown in the drawing, and recourse must be had to them to interpret the claim.

It has occurred to us that perhaps Fig. 1 of the drawing of the patent was not understood by the Court of Appeals in the Bradford case. It is a perspective view and should be understood by one skilled in interpreting mechanical drawings, but perhaps the draughtsman, while accurate, has not been happy in his illustration, and the following view at a different angle may make the matter more intelligible.



This view, exactly the same as Fig. 1 of the patent, but merely shown at a different angle, will perhaps convey to the Court a clearer idea of how expanded metal, made by this method, differs from the metallic lathing of the Ohl patent, and from expanded metal made by the prior methods, as well as the manner in which the sucessive operations of cutting, bending and

stretching the strands, when performed in the manner described, co-act or combine to expand the metal.

It seem to us, from the opinion of the Court of Appeals in the Bradford case, that that Court interpreted the claim of the patent, not for that method or process which we have described, and which it was the intention of the Examiner to protect, when he suggested the claim, but substantially for that which the patentee asked under his original first claim, and which the Examiner refused to allow.

That claim was as follows (p. 128):

> "The improvement in the art of manufactur-
> "ing expanded metal, consisting in simultaneously
> "slitting the sheet and stretching the severed por-
> "tions."

As worded this claim was merely the suggestion of the idea that the act of simultaneously cutting and stretching the severed portions of sheet metal might be applied to the art of making expanded metal.

This act was not new in itself. The novelty, if any, expressed in this claim, consisted merely in the idea or suggestion that the act might be applied to the making of expanded metal. In that there was no invention, and this is exactly what the Court of Appeals decided in the Bradford case.

The Court says (B. 245, 247) that

> "the precise improvement which the applicant"
> [patentee] "asserted that he had made was the
> "simultaneous cutting and opening, or expanding
> "the metal at the cuts by stretching the severed
> "portions." * * * "As we regard the appli-
> "cation, it was no more than the announcement
> "by Golding of a happy thought, unaccompanied
> "by any sufficient description of the means by
> "which his thought might be realized."

As we understand this, the Court has taken Golding's improvement to be merely the suggestion or thought that the idea of simultaneously cutting, bending and stretching metal strands might be applied to the making of expanded metal, that his improvement did not consist in any particular manner of doing this, but merely in the idea (B. p. 248):

> "Whatever the manner by which this simulta-
> "neous action is brought about, the claim is broad
> "enough to cover it, and the consequence is, as it
> "seems to us, that the applicant is asking for a
> "patent upon what may have been a valuable idea,
> "idea, but was, after all, no more than this. **His**
> **"specification and claim may be condensed into**
> **"a brief announcement to the world that it would**
> **"be an improvement in the process of manufactur-**
> **"ing expanded metal, to stretch certain portions**
> **"of the metal when the slit was cut and the mesh**
> **"was opened."**

Now this is exactly what was expressed by Golding's original first claim—the mere idea or suggestion that in the making of expanded metal, the strands might be simultaneously cut and stretched. It is this that the Government very properly refused to give him.

The invention consisted not in the idea that the simultaneous cutting and bending of strands, so as to stretch the severed portions, might be applied to the art of making expanded metal, but in the particular manner or method by which that idea might be applied.

It was the discovery of this particular manner or method of applying that idea—the successive performance of the separate operations in such relation to one another and to the material acted upon that expansion of the metal would result—that constituted the invention.

The Government's expert recognized this distinction, and while refusing to grant a patent for the ab-

stract idea, granted it for the particular manner or method of applying that idea for the purpose intended.

But the Court of Appeals for the Third Circuit, in construing this patent, apparently failed to see this distinction, and construed the claim to be drawn to the abstract idea, and so understanding it, declared it invalid.

In other words, the Court has considered the patent as if the claim it now contains was the original first claim which the Government refused to allow.

THE SUFFICIENCY OF THE DISCLOSURE OF THE INVENTION IN COMPLAINANT'S PATENT.

The Court of Appeals in the Bradford case said:

> "As we regard the application, it was no more "than the announcement by Golding of a happy "thought unaccompanied by any sufficient descrip- "tion of the means by which his thought might "be realized * * *
>
> "He did not explain how this was to be done, "save in a rudimentary way, until he made his "application for a machine to put his ideas into "practice."

Here again the Court shows that it misunderstood the invention. Supposing that the improvement described in the patent was merely the idea, or "principle", of simultaneously slitting, bending and stretching metal strands, and that "invention" could exist only in a machine for applying that principle, the Court said the the description was insufficient to disclose such *a machine*. Had the Court understood the invention to be a process consisting in a series of operations performed in a certain way; and had the Court had before it the evidence as to the sufficiency of disclosure which was presented in the General Fireproofing case, we believe it would have been impossible that the Court

should have made any such suggestion, as that contained in the above quotations.

If the real invention existed in the creation of an organized arrangement of instrumentalities to accomplish the object desired, the patent is obviously insufficient. It does not pretend to be a patent for a machine and does not attempt to describe such machine.

The patentee's invention consisted in a combination of certain operations in a certain relation to one another and to the material acted upon, by which a new result might be accomplished. The instrumentalities, which might be employed to carry out that invention commercially, were no part of the invention. What the patentee gave to the world was a new method of manipulating or cutting, bending and stretching sheet metal, to produce the thing known as expanded metal. That new method did not depend upon any particular instruments, it could be carried out by any one by such instruments as might be found best adapted to the purpose. A dozen different machines might be created for carrying out the process; in fact, several different machines have been created. Old machines might be reorganized and made to do the work.

Given the information as to the new method of treating, or acting upon the metal, the problem of creating a machine capable of doing it was a simple one, which could be solved by any skilled machinist. The invention consisted in the discovery of the *method*, not in any particular means for practicing it. Every true method or art is one which must be independent of particular means. Instruments must be used to apply it to practice, but the invention must reside in the method and not in the instruments.

> "While an art cannot be practiced except by
> "means of physical agents through which the force
> .. "is brought in contact with or directed toward its
> "object, the existence of the art is not dependent

"on any of the special means employed. It is a "legal, practical invention in itself. Its essence "remains unchanged, whatever variation takes "place in its instruments, as long as the acts of "which it is composed are properly performed."

Robinson, Vol. 1, 250, Sec. 167.

The patent laws require that a patentee shall explain his invention in a manner sufficiently clear to enable those skilled in the art to understand it. If the invention is a machine, then the machine must be described sufficiently to enable those skilled in the art to build and operate the machine; if the invention is a process, consisting, as a process must, merely in the performance of certain operations upon an article or substance, independently of the particular instruments employed, then the patentee must describe the performance of those operations sufficiently to enable those skilled in the art to practice them, leaving to such persons the choice of the instruments used for the purpose.

If, then, Golding's invention existed in a method of treating metal in a certain way; in the performance of certain operations upon it, it is sufficient if he described those operatons and the manner in which they were to be performed. It was unnecessary (and in fact would have been improper) for him to have described an organized machine for the purpose.

The Court of Appeals in the Bradford case finds the patent insufficient in its disclosure, because it does not describe such a machine. Such a machine was no part of Golding's invention. *The process* was sufficiently disclosed to enable those skilled in the art to understand it, as a process.

This is all that is required of a patentee. His description and illustrations are prepared for the skilled expert in the art, not for the unskilled. The Government employs trained experts to pass upon this ques-

tion, men charged with the duty of refusing to grant patents which are insufficiently explained. Golding's explanation was sufficient for the Government's expert, and it has proved sufficient to others skilled in the art —amply sufficient to enable infringers to understand and practice the invention by instruments or machines of their own devising.

We submit that under these circumstances the Court of Appeals for the Third Circuit was not justified in suggesting that Golding's patent is insufficient in its disclosure of his process.

It is true that the Federal judiciary are charged with the duty of *deciding* this question, but the Federal judges are not experts in the mechanical arts. An invention is not insufficiently described because the description is not sufficient for them. The sufficiency of the description has been approved by the Government's expert before the patent was granted, and there should be some evidence before the Court to justify a contrary finding. It is not for the Court to decide as to the sufficiency of the description, but as to the sufficiency of the evidence of sufficiency. The law requires only that the patentee shall so describe his invention as to enable those skilled in the art to understand it; the grant of the patent by the Government's expert raises a strong presumption that he has done so, and there should be competent expert evidence to justify the Court in finding the contrary.

There was no such testimony in the Bradford case. It is true that the defendant's expert in that case said that the patent did not sufficiently describe an organized machine, but it was not alleged that the *process* or operations to be performed were not sufficiently described.

In these cases none of the experts has questioned the sufficiency of the description of the process; and the evidence that it is sufficient is conclusive. The inven-

tion did not exist in any particular machine. The evidence shows that the invention of the process preceded the invention of a machine by nearly a year. Several machines have been devised for carrying out the process commercially. It was not difficult for any skilled machine builder, without an exercise of inventive faculties, to design machines for the purpose of using the process, after the process was known. Mr. Golding described the process so as to enable those skilled in the art to practice it. The discovery of the process was the work of the inventor; the designing of the machine the work of the mechanic.

Mr. James S. Merritt, an expert engineer and a user of expanded metal, says (G. F. P., p. 116) that the description of the method is amply sufficient to enable those skilled in the art to practice it, and that the patent contains full and complete information which would enable a designer having ordinary or reasonable skill to design a machine which would accomplish the desired result.

Mr. John B. Douglas, a skilled machinist, and an entirely disinterested person, who had examined the patent but a few minutes before testifying, says (G. F. P., p. 120) that he has had no difficulty in understanding the method, and could, without any difficulty, design a satisfactory machine for carrying it out. As he says (p. 121):

> "The machine for making it is simple enough, "but this," [the method described by him from the patent] "is the whole thing."

And, further, Q. 11. (p. 121) that a machine is not necessary for performing the process:

> "I could do it by hand."

And the fact is, that Mr. Golding did perform the process successfully by hand before he had invented any machine (G. F. P., p. 19).

There can be no doubt, that, considered as a method or process, the invention is sufficiently described in the patent to enable others to practice it; that is all that the law requires; and the suggestion of the Court of Appeals, in the Bradford case, that the description is insufficient, can be explained only on the theory that the Court supposed that the invention consisted, not in the method or process which the patent described, but in a machine for performing the method.

Upon this question the Court of Appeals for the Sixth Circuit in the General Fireproofing case say (G. F. P. 451):

> "But that Court felt constrained to reverse "the decree of the lower Court which sustained "the patent, because the conception of the thought "was unaccompanied by any sufficient description "of the means by which it might be realized. We "cannot agree to this, especially in the face of "the testimony on that subject in the present "record.
>
> "If the specifications for a process patent do "not sufficiently indicate to those skilled in the art "to which it relates some means or instrumentali- "ties by which it may be practiced, and the con- "trivance of means for effecting it is beyond the "skill of a trained mechanic, it might well be said "that the inventor had not shown how to make "his invention useful and therefore had not en- "titled himself to a patent. But here the inventor "has gone on to point out that the slitting and "bending is to be done by a stationary cutter "under the sheet and upper cutters to co-operate "in shearing the slit. These upper cutters are so "constructed as to bend down the strand to the "proper distance. It is not stated just what the "form shall be, but only ordinary skill in mechan- "ics would suggest that the outer side of the cut- "ter might be bevelled or a shoulder might be "formed thereon to carry down the strand when "severed.

"Mechanism for shifting the sheet and the "knives was already in use in machines for ex- "panding metal and, indeed, was common in the "mechanical arts. Moreover, experts have here "testified that these devices could be arranged by "any skillful mechanic, and we have no reason "to doubt it."

GOLDING'S INVENTION DID NOT CONSIST IN A MACHINE OR MANUFACTURE, BUT IN A NEW PROCESS IN THE ART OF EXPANDING METAL, AND IF IT IS NOT PATENTABLE AS SUCH, HIS IMPROVEMENT CANNOT BE PROTECTED UNDER THE PATENT LAWS OF THIS COUNTRY.

The Act of Congress classifies inventions as new arts, machines, manufactures and compositions of matter, or improvements thereof.

An art consists of an act or series of acts or operations performed upon an article, as distinguished from the particular instrumentalities used; the instrumentalities constitute a machine; the thing produced, a manufacture or composition of matter.

When Mr. Golding had worked out the new combination of acts or operations for expanding metal, by which the metal could be produced in a better way, and made more satisfactory for commercial use, he had certainly made an invention or improvement of some kind. That it was not a machine is apparent, because no machine was created. The process was first carried out by hand (G. F. P., p. 19; B., p. 10). A machine was not necessary to demonstrate it, or perform it, albeit, that to render the process commercially successful, some organized machine was necessary. As Mr. Douglas points out (Q. 11, G. F. P., p. 121), an organized machine is not necessary to the performance of the process and the production of expanded metal; it can be done by hand. After the method, or improvement, in

the art of expanding metal was made known, it was in the power of any skilled machine builder to devise a machine for using it commercially. This is true of all true processes.

The Court of Appeals in the Bradford case says (B. p. 247):

> "Indeed it does not seem unfair to add that "the applicant himself was in such doubt about the "validity of the patent in suit, by which he sought "to protect the method of manufacture therein de- "scribed, that he hastened to take out a patent for "a machine by which the desired result could be "accomplished, and obtained by letters No. 581,713, "all the advantages over his competitors to which "we think he is entitled."

There was absolutely nothing in the Bradford record to justify any such suggestion, and the record in the General Fireproofiing case shows a state of facts inconsistent with it.

After Mr. Golding had made the invention and had applied for his patent, and before he had invented any machine, he went to England for the purpose of introducing the new process there. Before his departure, however, he disclosed his new process to the officers of the Northwestern Expanded Metal Company, giving them certain instructions and suggestions, and under the direction of their foreman, one Seibel, they had a machine designed and built by Long & Alstat, of Hamilton, Ohio. This machine was successful and is still in use occasionally for making certain grades of metal (G. F. P., pp. 100, 103, 104, 112). Meanwhile Mr. Golding had himself perfected a machine for carrying out the new process for which he applied for a patent, May 20, 1896, *more than two years after the filing of the application for the process patent, and one year and seven months after that patent had issued.* Certainly this state of facts does not indicate either haste on

the part of the patentee, or the existence of any doubt in his mind as to the validity of his process patent, and we repeat, that the suggestion of the Court of Appeals in the Bradford case, that there was such haste or doubt, is without justification in the record.

We find, on the other hand, that the first machine that was built was not of Golding's invention, and it does not appear that such machine was ever patented. This Long & Alstat machine differed materially from the machine that was designed by Golding and is described in his patent 581,713 (XQ. 231, G. F. P., p. 111). Other machines also have been designed (XQ. 67, G. F. P., p. 23).

We submit that all of this shows that no serious problem was involved in the designing of a machine to perform the process, after the process was made known. As Mr. Golding says (Q. 19, G. F. P., p. 104), machine builders "would have no difficulty in building a variety of machines" to "cary out the process." Mr. Merritt (G. F. P., p. 116), and Mr. Douglas (G. F. P., p. 121), express the same opinion.

Not only did it not require an exercise of the inventive faculties to produce a machine for carrying out Golding's new process, but it could be carried out by the proper adaptation of old machines to the purpose. The new idea of means existed in the proper performance of the operations, not in the instruments by which they were performed. The attempt of the witness Gunz to produce expanded metal by means of the machine described in the Ohl patent is evidence of this. It is true that the Ohl machine is incapable of performing the process, not because it cannot simultaneously slit, bend and stretch metal, or because it cannot repeat that operation, or because it cannot alternate the positions of the bent and stretched loops—it can do all of these things—but it cannot expand metal, because it cannot perform those steps in such relation to one another and

to the metal acted upon that they will co-operate by the formation or half meshes, to produce the complete meshes and expand the sheet. This is admitted by defendants' witnesses (See page 70 *ante*). And the fact that the witness, Gunz, had to reorganize the Ohl machine to expand metal, establishes two essential facts: first, that the process was not the mere function of an existing machine, and second, that, when the process was known, no invention was required, on the part of an engineer or mechanic, acquainted with the art, to reorganize an existing machine to render it suitable for the purpose.

It was not the mere function of any existing machine, because there was no existing machine which was designed or intended to perform the operations in the manner necessary to carry out the process. They could be changed and adapted to the purpose, without the exercise of any inventive faculties, when the new method or process—the necessary combination of operations—was known, but when so changed, they were not performing their *functions* in the same way as before, albeit the functions themselves were not changed. There were plenty of machines, besides the Ohl machine, which would simultaneously slit, bend and stretch metal loops; that was the *mere function* of such machines, but these machines were not capable of performing that function in such a manner as to expand metal. When changed so that they could perform that function in that manner, they did not change the mere function of simultaneously slitting, bending, and stretching metal, but they performed that function in a new order or sequence, and performed a new process.

This is the difference between the "function" of a machine and a "process". The phrase "mere function of a machine", used by Mr. Justice Bradley, in *Cochrane* v. *Deener* (94 U. S., 788), was used in this sense and applied to the planing of wood, just as we are here

applying it to the act of simultaneously slitting, bending and stretching metal strands. In that mere function there could be no invention, because the function was old, but in a special *combination* of such functions, we have something that is entirely different—a method or process.

This, as we understand it, was the distinction which Mr. Justice Bradley had in mind, when he distinguished between "mere functions" of machine and patentable processes in *Cochrane* v. *Deener* (see page 118 *post*), and which Chief Justice Eyre referred to in *Boulton & Watt* v. *Bull*, 2 H. Bl., 463, 496, and which Vice-Chancellor Chatterton meant when he said, in *Bowling* v. *Billington*, 7 Pat. Off. Rep., 191:

> "I see no ground in law for refusing a patent "to a man for using a machine in a particular way "so as to produce a different product."

On this point the Court of Appeals for the Sixth Circuit in the General Fireproofing case says (G. F. P. 452):

> "Nor can we agree to the suggestion that the "patent was for the function only of a machine. "No doubt the function or principle of a machine "cannot be the subject of a patent. It is not a "distinct entity, but a mere property of the ma- "chine, and inseparable from it, and is developed "by its normal use. But Golding was not here "seeking to patent a machine or the operation of "a machine. It was a matter of indifference to "him by what particular means his method could "be practiced, but only that certain things should "be done in a certain order. The apparatus he "suggests would not by any known method of use "be of any value. True, he could slit and bend "sheets and strands of metal with it. That was "the function of it. But still, until and unless he "invented a specific method of use, his apparatus "was of no account."

Nor could the discovery be protected by a patent on the product. Expanded metal had been made before; as an article it was not new. True, the metal made by the new process is much better, but it is not radically different in kind; it is better merely because it is produced by a better process, but it is not a patentably new article. A new process of tanning is patentable, not because it produces a new kind of leather, but because it produces leather better, more quickly or more economically. The superiority of the metal expanded by the new process is very great, but the inventive act is not in the metal, but in the method of expanding it.

At the date of the invention described in the complainant's patent, and when Golding filed his application, he had certainly made a radical and very valuable improvement in the art of making expanded metal. His inventive act was not the discovery of a new machine, for he had discovered none, and no invention was required to produce such a machine; it was not in the discovery of a new manufacture or product, for the manufacture was not patentably new; and it follows, therefore, that the inventive act must have been the discovery of the new process. If this improvement cannot be protected as a process, then Golding's invention was one which was not susceptible of protection under the patent laws of this country.

COMPLAINANT'S PATENT DOES NOT ATTEMPT TO COVER A "PRINCIPLE."

That the Court of Appeals for the Third Circuit misunderstood Golding's invention is shown by the designation of the improvement as a "happy thought", and the quotation from Robinson citing *Burr* v. *Duryee* and *O'Reilly* v. *Morse*.

The Court of Appeals appears to have looked upon the single isolated operation of simultaneously slitting, bending and stretching strands as the subject of the

patent. Nothing could be further from the fact. That operation was old; it was used in the manufacture of metal lathing, and was shown in the Ohl patent, which was considered by the Patent Office during the prosecution of Golding's application.

Had Golding's supposed invention existed in this, it would not have been a "happy thought"; it would have been nothing new. The mere operation of simultaneously slitting, bending and stretching sheet metal, as we have endeavored to show, was old. The invention did not exist in any such operation, but in the combination of a *series of such operations* in such a manner that they co-act to produce a new result. The patentee did not claim the right to those operations or to a series of those operations, but to *the combination of those operations in a particular way.*

This was the distinction recognized by the Patent Office. It was understood that the single operation of simultaneously slitting, bending and stretching metal strands was old, and the claim of the patent was suggested by the Examiner for the very purpose of pointing out this difference, *i, e.,* that the invention did not exist in the single operation, but in the combination of a series of such operations, in a peculiar way, whereby they combined to produce the new result.

It is this **combination** of the operations in the particular way that constitutes the method or process, and we submit that to such an invention the principles of *O'Reilly* v. *Morse* have no relevancy whatever.

Perhaps no better statement of the difference between a "principle" and a patentable process can be found than that of Lord Chief Justice Eyre, in *Boulton & Watt* v. *Bull,* 2 H. Bl., 463, p. 496:

> "Undoubtedly there can be no patent for a "mere principle, but for a principle so far embod-"ied and connected with corporal substances as to "be in a condition to act to produce effects in any

"art, trade, industry or manual occupation, I think "there may be a patent. Now, this is, in my judg- "ment, the thing for which the patent stated in the "case was granted, and this is what the specifica- "tion describes, though it miscalls it a principle. "It is not that the patentee has conceived an ab- "stract notion that the consumption of steam in "fire engines may be lessened, but he has discov- "ered a practical manner of doing it; and for that "practical manner of doing it he has taken this "patent. Surely this is a very different thing from "taking a patent for a principle. It is not for a "principle, but for a process."

There would seem to have been some confusion in the mind of the Court of Appeals for the Third Circuit between the patentability of processes, involving mechanical steps only, and principles, but if the decision of the Court was based upon the supposition that the Golding process of making expanded metal was for a principle, it was a manifest misapplication of the doctrine of *O'Reilly* v. *Morse*. If Golding's improvement had been, as the Court supposed, the single step, operation or function of simultaneously slitting, bending and stretching metal strands, there would have been some basis for objection to the patent as being for a "principle"; but as the improvement was not the single operation, but a new combination of a series of such operations producing a new result by their co-action, it was neither for a principle nor for a function, but for a new and patentable process.

THE PATENTABILITY OF GOLDING'S INVENTION.

After all, the real defence in these cases is this: that, even though Golding had invented a new and useful improvement in the art of expanding sheet metal, which was not a machine or a manufacture or a composition of matter, it was not susceptible of protection

under the patent laws of this country, because it was a process or method which consisted of mechanical operations and did not involve chemical reactions or "elemental changes".

The defense contends that under the decision of this Court in *Risdon Iron & Locomotive Works* v. *Medart,* 158 U. S., 68, all such methods or processes, no matter how important, are excluded from the benefits of the patent laws. It is contended that unless an art, method or process involves some chemical reaction or elemental change, it is not patentable; that the process described in this patent consists of a series of mechanical operations which, though combining with one another to produce a result due to their conjoint action, do not involve such chemical or elemental changes, and therefore such process cannot be protected under the decision in the *Medart* case.

Our answer is: (1) That the decision in *Risdon Iron & Locomotive Works* v. *Medart* did not establish any such doctrine.

(2) That such a doctrine is foreign to the patent jurisprudence of other nations.

(3) That such a doctrine is illogical and unjust and contrary to the spirit of the Constitution and the intent of the patent laws.

(1) The decision in Risdon Iron & Locomotive Works v. Medart did not establish the doctrine that patentable processes were limited to those involving chemical reactions or elemental changes.

The patent involved in this case was for an alleged process or method of making pulleys by boring, shaping and fitting of parts together; it consisted of a series of separate, isolated steps, without any combination whatever between them; there was nothing novel in any of the steps; they were applied separately, and the re-

sult was the mere aggregation—arithmetical sum of the separate steps. No one step was combined with another to produce a result different from that which the steps produced separately. The patent was clearly void for want of invention; it did not constitute a new method, but a mere aggregation of separately applied operations, all of which were old in the art. The Court held that this was not patentable as a process or method, but the fact is, it was not patentable because it was not an invention.

It is true that when Mr. Justice Brown's opinion in this case was first read it created the general impression that the Supreme Court intended to establish the doctrine that processes or methods, although involving an exercise of inventive faculties, were not patentable unless they involved chemical reactions or elemental changes, and undoubtedly the language used in the opinion justified such an impression.

Later decisions of this Court, however, have shown that this was not the intention. In *Westinghouse* v. *Boyden Power Brake Co.*, 170 U. S., 537 (see particularly 557), such an intention is expressly disclaimed; and in the comparatively recent case of *Carnegie Steel Co.* v. *Cambria Iron Co.*, 185 U. S. 403, this Court sustained a patent for a process which clearly did not involve such acts.

In the case of *Westinghouse* v. *Boyden Power Brake Co., supra,* authough the question was really not involved, the Court used language which might tend to create the impression that this limitation with regard to the patentability of processes was the law, and Mr. Justice Shiras, in a dissenting opinion, strongly expressed his protest to any such doctrine (170 U. S., 574):

> "I cannot assent to what is perhaps rather in-
> "timated than decided in the opinion of the Court
> "that what is called a 'process' in order to be pat-

"entable must involve chemical or other similar "elemental action. The term 'process' or 'method', "as describing the subject of a patent, is not "found in the statutes. No reason is given in the "authorities, and I can think of none in the nature "of things, why a process or method may not be "patentable, even though a mechanical device or a "mechanical combination may be necessary to "render the new process practicable."

It is true that many of the Federal Judges have strictly followed the language in the Risdon case and have held processes of this kind unpatentable. Many such decisions will be found in the reports, and no doubt will be called to the attention of the Court.

On the other hand, many other judges have refused to take any such narrow interpretation of the law, or to adopt this illogical doctrine, and have held such processes patentable. As examples see:

Simonds Rolling Machine Co. v. *Hathorn Mfg. Co.*, 90 Fed. Rep. 201;

Melvin v. *Thos. Potter Sons & Co.*, 91 Fed. Rep. 151;

Kahn v. *Starrells*, 135 Fed. Rep. 532;

R. Thomas & Sons. Co. v. *Electric Porcelain and Mfg. Co.*, 111 Fed. Rep. 923;

Baker Lead Mfg. Co. v. *National Lead Co.*, 135 Fed. Rep. 546;

Kirchberger v. *American Acetylene Burner Co.*, 124 Fed. Rep. 764;

American Tube Works v. *Bridgewater Iron Co.*, 132 Fed. Rep. 16;

Shepard v. *Excelsior Steel Furnace Co.*, 137 Fed. Rep. 399;

J. R. Williams Co. v. *Miller DuBrul & Peters Mfg. Co.*, 107 Fed. Rep. 290;

Peters v. *Union Biscuit Co.*, 120 Fed. Rep. 679.

The Patent Office has refused to accept this doctrine on the authority of the Court of Appeals of the District of Columbia, and every week grants patents of the kind.

In the case of *In re Weston*, 94 O. G., 1786, 17 App. D. C. 431, Justice Morris says:

> "The decision in the case of Risdon Iron & "Locomotive Works *v.* Medart, seems to have been "understood by some Courts and to some extent by "the Patent Office as restricting the patentability "of processes to those which involved chemical or "other elemental action. But that this was an er- "roneous impression sufficiently appears from the "subsequent case of Westinghouse *v.* Boyden.
>
> * * * * * * *
>
> "And the general subject of patentability of "processes, other than those involving chemical or "other elemental action, is left open to question.
>
> * * * * * * *
>
> "Numerous other cases have been cited to us "wherein the Patent Office has issued patents for "processes of a merely mechanical character, as "distinguished from processes of elemental or "other smilar action, and it seems to us that, *in "the absence of any distinct and positive utterance "from the Supreme Court of the United States "limiting patentability to processes of the latter "character, it is not improper that the practice "should continue.*"

The same conclusion is reached *In re Wagner*, 106 O. G., 1873, 22 App. D. C. 367, and in *ex parte Patterson*, 116 O. G., 2533.

The records show that during the first two months of 1907 the Patent Office granted no less than sixty patents, for processes other than those relating to chemical reactions and elemental changes, all of which are invalid, if that doctrine is the law, which the defendants claim was established by the Risdon case.

In *ex parte Weston, supra*, Justice Morris has

divided so-called processes or methods into three classes:

(1) Those involving chemical or elemental action, which are clearly patentable.

(2) "Functions of machines", which are not patentable, and:

(3) Those residing in mechanical acts or steps, not the mere functions of a machine, which may or may not be patentable.

It would seem clear, therefore, that as the law is understood in the Federal Courts and Patent Office, at the present time, the Risdon case has not established the doctrine that processes consisting of a combination of mechanical operations, such as the process of the patent of this suit, are not patentable, and that the question of the patentability of such processes depends upon the nature of the steps or operations involved, and whether they constitute an "invention", in the sense that they are for a new and useful improvement and the result of an exercise of the inventive faculties.

(2) The doctrine that processes involving mechanical operations, as distinguished from chemical reactions or elemental changes, are unpatentable, is foreign to the patent jurisprudence of other nations.

Whatever may be the difference in the patent laws of the great industrial nations, the fundamental principle governing the granting of patents is the same. Such differences as exist in the patent laws are not differences relating to the nature of the property that is susceptible of protection, but differences in the manner by which that protection may be secured and the persons who may obtain it. In Great Britain and the Continental countries, an application may be filed and a patent obtained, under certain conditions, by anyone

who is not the actual inventor, while in this country, and in Canada, the application must be made by the inventor, or by his legal representative, if the inventor is deceased, or otherwise incapacitated from applying. These differences, however, relate only to the *persons* who may obtain protection, not to the nature of the property which may be protected. As to that there is no difference. The fundamental idea upon which the granting of patents is based is the same in all countries. It is that expressed in England by the Court of King's Bench as early as 1615 in *The Clothworkers of Ipswich Case*, Godb. 252, 1 Am., and Eng. Pat. Cases 6.

The patent is granted because the patentee has conferred something new and useful to the fund of public industrial knowledge. It must be a new and useful invention or discovery, whether it be the product of the brain of the applicant, as in this country and in Canada, or may have been the invention of another, from whom the applicant has obtained the inforamtion regarding it, as may be the case in Great Britain and in France and Germany.

This is the theory upon which the right to a patent is recognized in all countries. The thing for which protection is sought must not merely be new and useful, it must be an invention. And the standard of "invention" is even higher in some other countries than it is here—in Germany for instance, where it is well known that many improvements, which have successfully passed the American Patent Office, are thrown out by the German Office for want of "invention".

The thought that a man may *invent* a new process, art or method, which, although it meets all the tests of invention, novelty and utility, is still not susceptible of protection under the general principles governing the right of protection, is foreign, so far as counsel have been able to learn, to the jurisprudence of other nations.

If it were true that the doctrine, for which the defendant's counsel contend, under the decision in *Risdon Iron and Locomotive Works* v. *Medart,* is sound, then the law in this country differs from that of the other great industrial nations. This is a question of great importance in the present case, because of the fact that this process is the subject of identical patents in Great Britain, Germany and other foreign countries.

Those patents, under the laws of other countries, are valid, and if the patent is not valid here, it may mean a serious disturbance in this industry.

The fact that a process is based on steps or operations which are purely mechanical in their nature has never been recognized as a ground of invalidity in the English Courts.

Counsel are not aware of any British authority in support of the contrary, and cannot point to any case in which it has been sought to differentiate between processes patentable and non-patentable in this manner.

The more important dicta in the earlier cases, when the position of processes under the Statute of Monopolies may be said to have been in some doubt, apply to processes generally, and from the language used it is clear that no distinction of the kind now suggested was present in the mind of the Judges. For instance in *Boulton* v. *Bull,* Davies' Pat. Cases 162, Eyre, C. J., says:

> "The patent can only be for the mechanism, if "new mechanism is used, or for the process, if it be "a new method of operating, with or without old "*mechanism* by which the effect is produced."

Lord Tenterden in *The King* v. *Wheeler,* 3 Barn. & Ald. 350, refers to a patentable process as:

> "Carried out by known *implements* or ele- "ments acting upon known substances and ulti-

"mately producing some other known substance, "but producing it in a cheaper or more expeditious "manner, or of a better and more useful kind."

As instances of processes which resided in purely mechanical steps which have been upheld by the English Courts attention is directed to the following:

Hartley's patent for a method of securing buildings against fire by applying plates of metal (see the judgment of Eyre, C. J., in *Boulton & Watt* v. *Bull*, 2 H. Bl., 493);

Jones v. *Pearce*, 1 Webster Patent Cases, see p. 123, where Patterson, J., upheld the patent on the ground that "the claim was for the invention of a method of making wheels on the principle of suspension";

In *Russel* v. *Cowley*, 1 Web. Pat. Cases 459, the patent covered a method of welding tubes by drawing them through a die. (In this process a welding temperature is employed, but the invented process is purely mechanical.);

In *Walton* v. *Potter*, 1 Web. Pat. Cases 585, and *Gibson* v. *Brand*, 1 Web. Pat. Cases 627, are purely mechanical processes for making fabrics.

In *Reynolds* v. *Amos*, 3 Pat. Off. Rep. 215, the patentee claimed the use of chains for obtaining pressure in the making of ensilage.

In *Dowling* v. *Billington*, 7 Pat. Off. Rep. 191, the patent was for a purely mechanical method of weaving wire. In this case Chatterton, V. C., said, p. 199:

> "The machine is common to all and the whole "question is as to the method on which the product "of the machine is used. I see no ground in law "for refusing a patent to a man for using a ma- "chine in a particular way so as to produce a dif- "ferent product."

In *Tubes, Limited*, v. *Perfecta Seamless Steel Co., Ltd.*, 20 Pat. Off. Rep. 77, a patent was sustained for the mechanical method of compressing and drawing metal tubes.

Gammons v. *Battersby*, 21 Pat. Off. Rep. 322, and *Boulton* v. *Adjustable Cover and Boiler Block Co.*, 22 Pat. Off. Rep. 593, are other instances of processes of this kind.

We are advised that in Germany and France also the Courts have taken the same view of the patentability of such processes.

(3) The doctrine that processes are not patentable unless they involve mechanical reactions and elemental changes is unjust and contrary to the spirit of the Constitution and the intent of the Patent Laws.

Following the principles established in England under the Statute of Monopolies, the Constitution empowered Congress "to promote the progress of science and useful arts by securing for limited times to authors and inventors the exclusive right to their respective writings and discoveries".

In pursuance thereof Congress has passed an Act under which:

> "any person who has invented or discovered
> "any new and useful art, machine, manufacture
> "or composition of matter, or any new and useful
> "improvement thereof,"

may, under certain conditions and upon complying with certain regulations, secure a patent in accordance with the Constitutional provision.

The Constitution placed no restriction or limitation upon Congress as to the nature or character of the invention or discovery, which might be the subject of protection, and the presumption is, that Congress, in the Act quoted, intended to fully put into effect its

constitutional authority; and, in defining an invention or improvement which might be protected by patent, as an "art, machine, manufacture or composition of matter", intended to comprehend all real inventions, rather than to exclude or eliminate any particular class from the benefits of the Act.

The standard, by which is measured the patentability of inventions or improvements relating to "machines, manufactures and compositions of matter", is that they shall be new, useful and the result of the inventive faculties, as distinguished from the merely imitative faculties; and counsel cannot understand the logical basis for adopting a different standard regarding the remaining class of inventions or improvements referred to in the Act, *i. e.*, those relating to arts or processes. If the processes are new, useful and the result of the inventive faculties, as distinguished from the merely imitative faculties, they should be entitled to protection just as much as are the other classes of inventions, and we submit that to hold otherwise is illogical and unjust.

The patentability of arts or processes under the Statute of Monopolies was seriously questioned and debated, but finally recognized and established in England, and there can be no doubt that Congress has extended the protection of the patent laws to this class of inventions, as they are expressly included in the Acts. If such is the case, the patentability of such inventions should not be measured by other standards than those which apply to other classes of inventions.

An "art", as the term is used in patent law, may be defined (Cent. Dic. Tit. "Art", 4) as: "A system of rules and traditional methods for facilitating the performance of certain actions," as, *e. g.*, the art of weaving, dyeing, printing and the like. More specifically, it may be defined as an act or a series of acts performed upon an article to transform or change it to a different

state or thing (*Cochrane* v. *Deener*, 94 U. S., 288). Very few, if any, arts can be practiced without the use of instrumentalities or machines, but the "art" relates, not to the instrumentalities, but to the steps or acts performed, albeit they cannot be performed without such instrumentalities.

> "While an art cannot be practiced except by means of physical agents through which the force is brought in contact with or is directed toward its object, the existence of the art is not dependent on any of the special instruments employed. It is a legal, practical invention in itself. Its essence remains unchanged, whatever variation takes place in its instruments, as long as the acts of which it is composed are properly performed."
>
> *Robinson on Patents*, Sec., 167, Vol. I, p. 250.

The idea that an "art" to be patentable under the Acts of Congress must involve some chemical reaction or elemental change, and cannot reside in a series of steps purely mechanical, is fanciful; and results in the establishment of an illogical and false standard of patentability.

This theory apparently had its origin in the dictum of Mr. Justice Bradley, in Cochrane *v.* Deener that the "mere function of a machine" was not patentable as an art. As a general proposition we do not deny this rule, but we do deny the false differentiation of processes which has been built upon it. It is clear from the examples just cited that Mr. Justice Bradley did not mean that arts ceased to be patentable arts because machines or mechanical instruments might be used for carrying them out. Nothing could have been further from his mind, because the particular patent under consideration in that case, the validity of which was sustained, was one to a process which did depend upon the use of machines and mechanical instruments and

did not involve any chemical reaction or elemental change. What he meant was that, while a machine might be new and patentable, its functions might be old. There might be a new machine for performing an old process, such as planing wood, which is one of the examples he cited, and it was clear that a patent could not be granted for the mere function of such a machine. The reason of this is not because the planing of wood is not an "art", but because such mere function, *i. e.*, the act of planing is not new. Invention may have been involved in the production of a planing machine, but not in the mere function of planing.

But if a man discovers a new method in the art of planing wood (supposing such a thing to be possible at this stage of the art of woodworking), by which he caused old functions *to be combined together in a new manner*, so that a new and better method of planing wood is produced, although the separate functions are necessarily performed by some instruments, whether new or old, such a combination of functions would not be the mere function of a machine, but a new process or art, and if its discovery was the result of an exercise of the inventive faculties, it would constitute an "invention" within the Statutes, just as much entitled to protection, as a new machine, manufacture or composition of matter.

It was undoubtedly this thought that was in the mind of Vice Chancellor Chatterton when he said in Dowling *v.* Billington, 7 Pat. Off. Rep. 191, *supra*:

> "I see no ground in law for refusing a patent "to a man for using a machine *in a particular way*, "so as to produce a different product. The in- "vention resides not in the mere function of the "machine, but in its use *in a particular way.*"

The mistake has apparently been in taking this reference to the "function of a machine" in *Cochrane*

v. *Deener* and other cases, as applying to mechanical appliances generally, and thereby creating a new and special standard of patentability for that class of inventions known as "arts".

There can be no doubt that many methods have been devised for transforming or reducing an article to a different state or thing by a series of steps performed upon it, where the steps are purely mechanical, and yet have involved an exercise of the inventive faculties in the very highest degree. There is no reason in the nature of things why the inventors of such methods should not receive the protection of the patent laws.

The distinction between the mere function of a machine or piece of mechanism, which is not patentable under the doctrine of *Cochrane* v. *Deener,* or the mere aggregation of a series of such functions which is unpatentable under the true doctrine of *Risdon Iron & Locomotive Works* v. *Medart,* and a *combination* of functions, which constitutes a new process, is very clearly brought out by the patent in this case.

The simultaneous slitting, bending and stretching of a metal strand is the mere function of a pair of cutting dies, and is the inevitable result of the use of such dies in the usual manner; it is the "mere function" of such dies, and cannot be patented as a process. A man may have a patent for an improvement in such dies, but not for the mere function of simultaneously cutting and bending. In the Ohl patent we have an aggregation of a series of these functions. Each function or operation is the same, but there is no combination or change in result; nothing is obtained but the arithmetical sum of the separate operations as in the Risdon case.

In the patented process, however, although each operation is the same as before, and, considered separately, is still the function of the dies, those operations are combined together in such a manner that the re-

sult of one affects the result of the other, and *the combined result* is not the mere aggregation of the separate functions, but a result due to their combination; each operation makes but a half mesh, that is the mere function of the dies, an aggregation of the operations makes a series of separate uncombined half meshes—the Ohl lath; but a *combination* of those functions, in the particular manner described in the patent, makes a series of complete meshes and thus expands the metal.

On this point the Court of Appeals for the Sixth Circuit in the General Fireproofing case said (G. F. P. p. 452):

> "We think the invention may rightly and "aptly be characterized as an improvement in "the art of expanding sheet metal, and within "the letter and spirit of the statute. To hold "otherwise would be to adopt a rule which would "operate to exclude from the benefits of the law "many valuable inventions of things new and use- "ful, and this, not by resting upon any exception "found in the statute, but upon an artificial graft "of error alien to its spirit and purpose."

There is no reported instance in which such a combination of operations has been held unpatentable as a process, except this, and it is clear that the Court of Appeals for the Third Circuit, so held because, it misapprehended the invention, and supposed that the alleged improvement consisted in the mere function of simultaneously slitting, bending and stretching the strands, instead of in the *combination*—not aggregation or mere repetition—of a series of such operations in such manner that they would combine to produce a result due to their conjoint action.

That decision was based on the opinion of this Court in *Risdon Iron and Locomotive Works* v. *Medart*, but the difference between such an invention as this and the improvements that were covered by the patents

involved in that case are pointed out by the Circuit Court of Appeals for the Sixth Circuit in the General Fireproofing case. In the Medart case there was no combination of operations; there was merely an aggregation of separate operations, all of which were old. An improved pulley was produced, but the result was merely the aggregation of the separate operations.

If it be conceded—and it cannot be logically denied—that an exercise of the inventive faculties can be involved in the discovery of a *combination of functions*, acts or operations, by which a new and useful result is obtained, then to deny the patentability of such inventions is to establish a false standard of patentability, and to exclude a large class of meritorious inventors from the protection of the patent laws. Such a false standard is not recognized in other countries, it is not within the spirit of the Constitution or the meaning of the Statutes, and we believe it was never the intent of the Supreme Court to create it.

Attention is called to an article on Patentable Processes by William B. Whitney, Esq., of the New York Bar, in the Harvard Law Review Vol. XIX No. 1, in which this question is ably discussed and the same conclusion, as that here presented, is reached—that the patentability of processes must be determined solely by the same standards as other classes of inventions—novelty, utility and "invention".

Measured by these standards we submit there should be no doubt as to the validity of the Golding patent in suit. It presents in exceptional degree those peculiar *indicia* of invention; the unsatisfactory results of existing processes; the demand for improvement continuing through several years; the unquestioned improved results of the new process; its commercial success, and the general abandonment of the old process for the new.

As was said by Judge Coxe in the recent case of *O'Rourke Engineering Construction Co.* v. *McMullen, et al,* in the Circuit Court of Appeals for the Second Circuit, 160 Fed. Rep. 933, 938.

> "Where the Court has to deal with a device which has achieved undisputed success and accomplishes a result never attained before, which is new, useful and in large demand, it is generally safe to conclude that the man who made it is an inventor."

ERNEST HOWARD HUNTER,

of Counsel.

Philadelphia, March, 1909.



Supreme Court of the United States.

GENERAL FIREPROOFING COMPANY,
Petitioner, Defendant,

vs.

EXPANDED METAL COMPANY,
Complainant.

October Term, 1908.
No. 606.

THE EXPANDED METAL COMPANY and HENRY CHESS, WALTER CHESS and HARVEY B. CHESS, Co-partners as CHESS BROTHERS,
Petitioners, Complainants,

vs.

EUGENE S. BRADFORD, JOSEPH C. MILLICHAMP, N. J. SCHMUCKER, JR., and N. J. SCHMUCKER,
Defendants.

October Term, 1907.
No. 289.

ON WRITS OF CERTIORARI TO THE UNITED STATES CIRCUIT COURTS OF APPEALS FOR THE SIXTH CIRCUIT AND THIRD CIRCUIT.

BRIEF FOR PETITIONER, GENERAL FIREPROOFING COMPANY, DEFENDANT.

Statement of Case.

The bill of complaint charges infringement of Letters Patent No. 527,242, granted to John F. Golding on October 9, 1894, for a Method of Making Expanded Sheet Metal.

There have been conflicting decisions of Circuit Courts of Appeal on the subject of this patent. In a suit brought by the complain-

ant herein for infringement of this patent against Bradford and others in the U. S. Circuit Court for the Eastern District of Pennsylvania, a decree was entered sustaining the patent as valid and ordering an injunction and an account. The opinion of the Circuit Court rendered by Judge HOLLAND is reported in 136 F. R., 870. On appeal to the Circuit Court of Appeals for the Third Circuit, the decree of the Circuit Court was reversed and the patent held to be invalid, the opinion of the Circuit Court of Appeals being reported in 146 F. R., 984. By writ of *certiorari* the case was removed to this Court, where it is now pending.

In the case at bar, which was brought in the U. S. Circuit Court for the Northern District of Ohio, the patent in suit was held by the Circuit Court to be invalid, and a decree was entered dismissing the bill. The opinion of the Circuit Court, delivered by Judge TAYLER, is reported in 157 F. R., 564. An appeal from that decree was taken to the Circuit Court of Appeals for the Sixth Circuit, and that Court filed an opinion (Record, p. 448), holding the patent to be valid and infringed by the defendant (the petitioner herein), and reversing the decree of the Circuit Court. A petition for writ of *certiorari*, thereupon filed in this Court by the defendant, was granted and the case at bar now comes before this Court in pursuance of that writ.

Statement of Errors of the Circuit Court of Appeals.

We submit that the Circuit Court of Appeals for the Sixth Circuit erred in the following respects:

FIRST. In not adjudging that the claim of the patent in suit is invalid for lack of novelty and that the method or process therein set forth was disclosed in the prior patents of record.

SECOND. In not adjudging the patent in suit to be invalid, for the reason that all that is properly involved in the specification is the mode of operation of a particular mechanism for carrying out an old process of making expanded metal. Therefore the patentee in effect claimed merely the function or result of a machine.

THIRD. In ruling that, by the invention of the patent in suit, "a new and different result is produced, a difference so great as to supplant all previous results," the fact being, as shown by the ex-

hibits in evidence in the case at bar, that the same product as is produced by the alleged method of the patent in suit was also produced by the methods and machines previously known and used in the art, and particularly the methods and machines of the prior British Patent of Long, No. 2125 of 1862; the British Patent of Johnson, No. 11,332 of 1885; the prior U. S. Patents of Golding, No. 297,382, dated April 22, 1884, and No. 320,340, dated June 16, 1885, and the prior U. S. Patents of Golding & Durkee, No. 320,241, and No. 320,242, dated June 16, 1885; and No. 381,230, dated April 17, 1888; the machines of the said prior patents of Golding & Durkee being shown by the proofs to be now largely in use and not supplanted by the methods and devices of the patent in suit.

Defendant's Argument Summarized.

The case at bar involves no new or unsettled principle of law.

The subject of the patent in suit is the manufacture of expanded metal. This product, expanded metal, was old. It was first disclosed and fully described in a British specification, No. 2125 of 1862, of Thomas Long, and the method of its manufacture was therein fully set forth, namely, the slitting of a metal sheet with successive lines of short slits, the slits of each line alternating in position with the slits of the adjacent line, and the sheet being expanded or opened by pulling out the strips of metal connecting the slit portions. This operation was also described in other patents prior to the date of the patent in suit, notably the British patent of Johnson of 1885 and the U. S. patents of Golding, No. 297,382 of 1884 and No. 320,240 of 1885, and is the only process or method involved in the operation recited in the patent here in suit.

In 1885 Golding & Durkee patented a machine (Patent No. 320,-241), which is still largely in use, for making this old product, expanded metal. It effected the alternate or "break joint" arrangement of the cuts by using vertically reciprocating cutters arranged in step form, and feeding the sheet obliquely to the cutters. By reason of the stepped arrangement of the cutters they pressed down the cut strips of metal in oblique lines, and thus at each cut formed strands in alternate places without the lateral shifting of the metal sheet. Their mode of operation was such that they did not greatly strain the metal and they were consequently adapted to cut and expand thin sheets.

When, however, Golding came to treat thick sheets, he required cutters especially adapted for that purpose. He therefore devised a machine with knives arranged in a straight row instead of a stepped row. In this machine the alternation in the position of the cuts was effected by shifting the cutters or the sheet itself between each stroke of the cutters. This machine, by reason of the shape and arrangement of the knives, stretched the metal to an extent greater than the previous machines had done, but like the prior machines it operated upon the sheet in alternate places, that is to say, so that one line of cuts "broke joint" with the adjacent line. This alternate location of the cuts was old and the product of the machine was old. What is involved in the patent in suit is an effort to claim the function or mode of operation of this subsequently invented machine of Golding, a machine which performs an old process and produces an old product. In performing the old process the machine works according to its own peculiar manner or mode of operation; but almost all machines have distinctive modes of operation; and the rule of law that such modes of operation are not patentable, and that results are not patentable, but only new processes and new mechanisms and new articles, renders the patent in suit invalid.

In brief, our contention is that the process involved in the patent in suit is simply an old process of making expanded metal, known and practiced long before the patent in suit; that the only possible novelty is in the mechanism, imperfectly set forth in the patent in suit and patented to Golding in another patent which is not here in suit; that the patent in suit is in effect an attempt to cover the mode of operation of this mechanism; that the patent in suit is not a pioneer patent in any sense; that the products and processes of the prior state of the art are still largely in commercial use; that the only reason for the success which has attended the device of the patent in suit is that the machine indicated therein was adapted to treat heavy metal, that in the modern art of concrete reinforcement heavy expanded metal has had a large use, and therefore that machines adapted to produce heavy metal have been largely used. This does not argue any novelty in method, but simply argues the adaptability of the machine to produce the heavy metal which is now demanded.

We submit from the foregoing statement of our contention that the case at bar involves no new principle of law, but that, on the contrary, it involves only the rule of law that patents for methods

or processes can only be granted for methods or processes which are new as methods or processes; that a new machine devised for the practice of an old method does not entitle one to a patent for a method of operation although it may have, as most machines have, a distinctive mode of operation. This principle has been repeatedly affirmed in the decisions of this Court and is, we submit, perfectly applicable to the case at bar.

Without attempting at this point to establish in detail the propositions which we have stated above, we wish to call attention to two points, appearing of record, which will simplify the issues of the case.

In the petition for rehearing filed by the complainant in the suit against Bradford and others and forming part of the transcript of record in the case now pending before this Court on *certiorari*, No. 289, Oct., 1907, it was stated by the complainant in defining the relation of the patent in suit to the prior state of the art as follows (p. 234):

> "The operation of simultaneously cutting and bending metal so as to stretch the strand was old. What Golding discovered or invented was the act of repeating that old operation *in such a way that the two operations would combine to produce a new result by reason of their combination.*
>
> "Perhaps in our argument we emphasized too much the feature of stretching, from which the Court appears to have concluded that in this alone resided the inventive act. Simultaneous cutting and bending was old in the art of expanding metal; but in that method the strands were not stretched; in the new method the strands are simultaneously cut, bent and stretched. The new or added *characteristic* was the stretching, but the *inventive act* did not lie in the mere thought or suggestion that the strands should be stretched at the same time they were cut and bent, as the Court appears to suppose. That idea was old in the cognate art of making metallic lathing by punching up loops in sheets. It has been known for years. There was nothing new, therefore, in the idea of stretching strands *per se*."

On page 235 of that petition the complainant said:

> "It certainly must have been known to Golding and Durkee, at that time, or to anyone familiar with the art of

metal working, that metal could be simultaneously cut, bent and stretched ; any metal punching or stamping machine did that. But it was not known that that operation could be applied to the making of expanded metal, because its application was not obvious and did not lie within the skill of the calling. And it did not lie within the skill of the calling because that operation was available for the production of expanded metal only when it was applied in a certain manner. It was this manner of applying that known operation that Golding discovered and in which his invention exists."

These statements amount to an admission that all the steps of the process recited in the claim of the patent were old, and that the only alleged novelty is in the application of the known and familiar step of stretching metal strands to the known process of expanding sheet metal.

The second point to which we wish to call attention is the inconsistent position into which the exigencies of the case have driven the complainant in the two suits now pending before this Court on writ of *certiorari*. In the case at bar, where the defendant's machine has a guillotine-shape knife carrying a series of cutters arranged in a single straight line and therefore necessarily operating at each stroke in a straight line from end to end of the sheet, the complainant, in order to sustain its contention of novelty in the method, has found it possible, without at the same time differentiating its patent from the defendant's machine, to contend that a novel step of the method patented was the forming of the cuts in the sheet of metal in a straight line and then, in successive operations forming other parallel series of cuts in alternate positions. This contention was made in the brief of the complainant in the Circuit Court of Appeals for the Sixth Circuit, and is repeated in substance on page 43 of the brief in this Court.

In the suit in the Circuit Court for the Eastern District of Pennsylvania against Bradford, now pending in this Court on writ of *certiorari*, the defendant's machine in this respect is substantially different from that of the defendant in the case at bar. It does not make a single line of cuts extending from end to end of the sheet, but makes diagonal cuts arranged like the cuts produced by the machine of the prior patent of Golding & Durkee. The interpreta-

tion which the complainant puts upon the claim of the patent in the case at bar is rendered impossible and untenable by the charge of infringement which it makes in the Bradford case. In these two suits the complainant has assumed different and contradictory definitions of the patented invention.

Prior State of the Art.

The inventor of expanded metal was Thomas Long, an Englishman. In 1862 he filed in the Patent Office of Great Britain a specification (Record, p. 261), in which he stated as follows:

> "According to this invention, it is proposed to make open metal work or trellis or lattice work by making a number of slits in a flat sheet of metal, such slits being made in straight or curved lines or rows, the slits in each line or row being made to break joint with the adjoining lines or rows, a small portion of the metal being left intact or uncut between the ends of the several slits. The sheet having been thus slit, is now stretched out so as to open the slits, whereupon a perfectly-formed trellis having hexagonal openings will be produced."

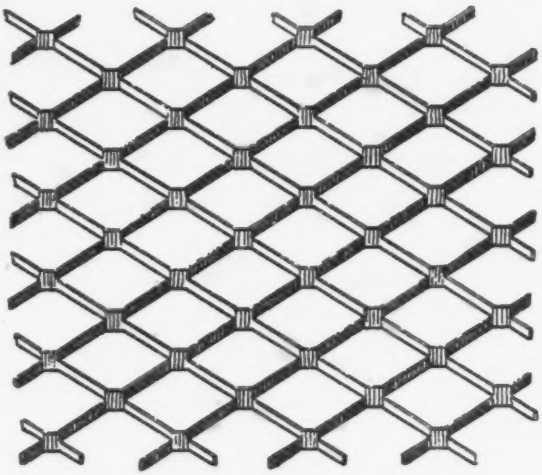
A distinctive feature of Long's disclosure was that the slits of the second line "break joint" with the slits of the first line, and so on throughout the blank, and that the slits co-operate with one another in the formation of strands, which in turn make the meshes of the expanded product.

Golding's Patent No. 297,382, April 22, 1884.

In 1884, John F. Golding, the patentee of the patent in suit, obtained a patent, No. 297,382, wherein he described the same process of making expanded metal as that which was described by the earlier patent of Long, and illustrated it with drawings, here reproduced, the first of which showed a sheet of metal slitted with rows

of alternating slits, and the second of which showed the sheet opened by pulling the slitted strands.





In a suit for infrigement brought by Golding's assignee (the complainant in the case at bar), this patent of Golding was held by the Circuit Court of Appeals of the Eighth Circuit to be invalid because of anticipation by the prior patent of Long. In the opinion of that Court, delivered by Judge SANBORN and reported in 111 F. R., 395 *(Expanded Metal Co. vs. Board of Education)*, it was said :

> " This specification of Long contains a perfect description of the manufactured article and of the method of manufacturing the article, described and claimed in the patent to Golding. The only essentials for the manufacture of this article according to the patent are a sheet of metal, slits made therein so that they will *break joints with each other*, and the stretching or expanding of the metal in a direction

transverse to the length of the slits. These essentials are as clearly portrayed in the specification of Long as in that of Golding." (Italics not in original.)

The Circuit Court of Appeals of the Eighth Circuit in the opinion just quoted found that "the only essentials for the manufacture of this article [expanded metal] according to the patent are a sheet of metal, slits made therein *so that they will break joint with each other*, and the stretching or expanding of the metal in a direction transverse to the length of the slits." This is a correct statement of the essentials of the process of manufacture of expanded metal, and they are to be found in every operation or machine heretofore invented for that purpose. It is a statement of the *process* by which all expanded metal is made, including the material made by the parties to this suit. Every improvement made in this art since the date of the patent of Long has been an improvement in means by which this old process is carried into effect; but the *process* in every case has been the same.

Johnson's British Patent of 1885.

In 1885, a British patent was obtained by one Johnson who described and claimed an operation similar to that of Long, illustrated it by drawings (page 263), and described it as follows:

> "This invention has for its object to manufacture simply, expeditiously and cheaply metal sheets into lattice-work, trellis-work sieving or equivalent open metal work—According to this Invention a metal sheet is taken and at intervals rows or circles of slits or slots are formed, the slits or slots of each row 'breaking bond' with those of the adjacent row or rows—The plate is then pulled in a direction or directions transversely to the length of the slits or slots and over a suitable former or mould if desired and there is thus produced an open metal work suited to the purposes to which ordinary lattice work or woven or interlaced metal strips or wires are usually applied."

Golding's Patent, No. 320,240, of 1885.

This patent was granted nominally for "a process" of making expanded metal, but really for a mere variation of the manner of

practicing the old process of the patent of Long. It is based upon the perception of the fact that a sheet of metal which has been slitted with rows of alternate slits as described in the patents of Long, Golding and Johnson above cited, can be expanded or opened, either by pulling it from the corner and in the plane of the body of the sheet, or *by pressing down at right angles to the body of the sheet line after line of the slitted strands successively.* It is this second mode which forms the subject of the patent, for the specification states (Record, p. 295) :

> " I take a piece of metal and make a series of rows of incisions throughout it, and between the ends of these incisions I leave uncut spaces, these incisions or cuts being so arranged that the uncut spaces will be at or about midway of the adjoining cuts, and thus the incisions or cuts and the uncut spaces are made to alternate throughout the sheet, the uncut spaces connecting the strands one with another, and the whole remaining in one piece, as is shown in Fig. 1. The metal thus prepared is opened at the slits by causing the cut edges to be passed by each other all in the same direction, and away from the original plane of the metal a sufficient distance to produce the desired size of mesh."

The first claim of this patent defined the invention as follows :

> " 1. In the art of making screening from slashed metallic plates or sheets, the improvement of bending the strands flatwise, line after line of strands successively, in forming the meshes, and setting the strands, substantially as before set forth, so that the strands will be disposed edgewise in the thickness of the finished screening."

It is easy to see that if a slitted sheet is opened in the manner stated in the claim just quoted, "*line after line successively,*" the bending of the straight slitted strands into the angular open meshes will (for the reason that the sum of two sides of a triangle is longer than the other side) make it necessary to stretch the material of which the strands are composed by just so much as the difference in length between the opened angular strand and its original unopened condition. Hence the practice of the operation described in this patent No. 320,240, necessarily involves the stretching of the slitted alternate strands as they are opened " line after

line." It is equally plain that it involves necessarily the opening of the strands so as to form a row of half-diamond meshes along the edge of the sheet at each opening operation and to complete to full diamond shape the line of half-meshes opened at the previous operation. The only difference between the operation of this prior patent No. 320,240 and that of the patent in suit is that in the prior patent the sheet was first to be slitted and the strands bent down line after line, whereas in the machine suggested in the patent in suit the act of bending down the strands line after line is simultaneous with the slitting. If the acts of slitting the metal and then bending down the portions between the slits line after line, produced expanded metal when performed separately, it is difficult to see what novelty there can be in effecting the same result when the setting and bending down are done simultaneously with the stretching of the strands, and especially so because the simultaneous slitting and opening of the strands was old prior to the patent in suit.

Golding & Durkee's Patents Nos. 320,241 and 320,242 of 1885; the so-called Second Process.

It is evident that when Golding attempted to put into practice the "line after line" opening of the strands set forth in his Patent No. 320,240, he must have noted that this could not be done without stretching the strands, and that the thin sheet metal then employed for making expanded metal would not endure such stretching without breaking; for in his later patents No. 320,241 and No. 320,242, obtained jointly with one George B. Durkee, Golding describes a machine and its process or mode of operation wherein the metal sheet is simultaneously slitted and opened, not in straight lines, but in diagonal lines, by means of cutters arranged in stepped order; and in the specification of the patent No. 320,242 he states that the purpose of his machine is to enable the sheet to contract in length while being cut, and (consequently) to minimize the stretching of the strands. Golding had distinctly in mind and then disclosed the fact that cutters which operate in a straight line along the sheet will necessarily stretch the strands; and the testimony indicates that he avoided the use of such cutters only because the trade then demanded thin metal which would endure but little stretching. This precludes Golding from subsequently claiming—as he does in the patent in suit—the

function of such straight line of cutters, to which he naturally reverted when a demand for thick metal sheets arose. The statement of Golding's specification to which we refer above appears at page 313 and is as follows :

> " The object of beginning to cut within one side and the corner is, that the cut furthest within the metal will produce a strand which as it is cut and bent downward or away from the plane of the uncut metal will allow the strands in advance of it to be freely cut and bent away from the plane of the metal simultanously therewith. *It is evident that the meshes could not be cut and simultaneously formed if the cuts were made in a single direct line across the metal, for the reason that as the meshes are made the article which they form is contracted to a length less than the original length of the metal from which it is cut.* (Italics ours.)
>
> " By inspecting the drawing it will be observed that the line between the cut and uncut parts of the metal is in step form, thus forming an oblique line across the metal."

The machine disclosed by Golding in his patent No. 320,241, was designed for the purpose of practicing the operation described in his patent No. 320,242. It was a guillotine machine whose vertically moving cutter-bar carried a series of knives arranged in stepped order as shown in figures 1, 5 and 7 on pages 298–304 of the record. The knives were in a row and arranged so that the first end knife partly overlapped the second, and the second partly overlapped the third and so on to the other end of the row. The sheet was fed to the knives in a slightly oblique direction, the oblique feed being made necessary by the overlapping of the knives. In consequence of the oblique feed the corner of the sheet was first presented to the knives. On the first stroke the first knife engaged the sheet, and on the next stroke the second, and so on, additional knives coming into play until the entire row was operating upon the sheet diagonally of the sheet. As the knives slit the metal they pressed down the slitted portion, opening it out into a strand, thus simultaneously slitting and bending portions of the plate. In the next stroke of the machine, the metal *was similarly slit and bent in places alternate to and back of the preceding cuts* and so on progressively until the entire sheet was opened out.

In order to permit the meshes as they were opened to move or swing sidewise, and thus to avoid as much as possible the stretch-

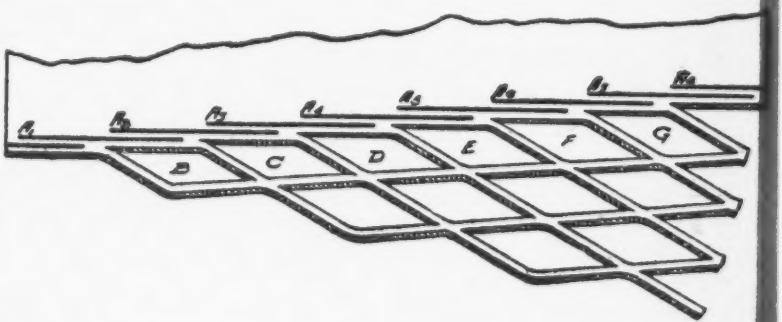
ing of the strands which would result if the knives operated in vertical straight lines, the lower knives or bed knives of the machine were attached to a horizontally movable bar N which moved or yielded horizontally in the plane of the knives as the upper knives descended. The second claim of the patent described the mechanism as follows:

> "2. In a machine for cutting slashed metallic screening, the bar K, provided with cutters cutting over bar N, provided with similar knives, the first working vertically while the second is working horizontally, to provide the necessary cutting surface and space for the cut loops to expand."

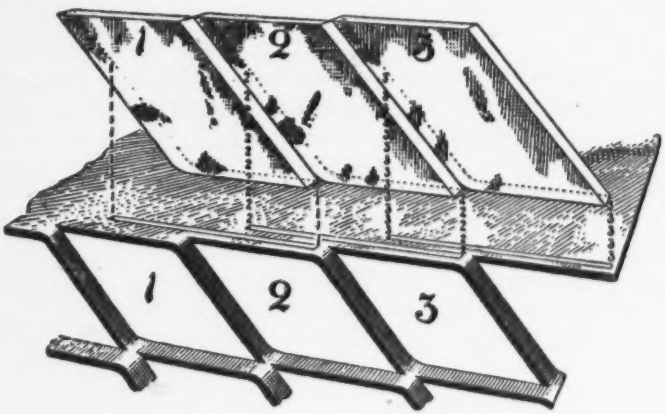
As the guides of this machine were so placed as to feed the sheet to the knives in an oblique direction, and the slits extended to the extreme outer edge of the sheet, it followed that as the slitted strands were opened out the sheet was shortened to an extent depending upon the length of the cuts and the angle to which they were opened out, but at the same time the act of expanding widened the sheet greatly.

The following figure shows the sheet in the operation of being cut and opened by the machine of the patents of Golding and Durkee. The knives being arranged in stepped order and the sheet being fed obliquely, the lower knives having a lateral motion during the cutting, the meshes as they are opened are free to swing sidewise and thus to be opened with little stretching of the strands.

FIG. 8.



This is well illustrated by the following figure, which shows the stepped arrangement of the upper knives 1, 2 and 3 of the Golding and Durkee machines in the act of descending upon the sheet. Their lateral shearing edges are oblique, as shown, but the knives themselves move vertically, as indicated by the dotted lines. As they move they slit the metal sheet and open the meshes and at the same time swing the meshes sidewise. Each knife as it descends opens the cut strand into the form of a half-diamond mesh, the other half of the diamond being simultaneously formed by the stepped knife back of it. The lower edgewise yielding knives are not shown.



The Golding and Durkee Patents No. 381,230 and No. 381,231 of 1888 (Record, pp. 322, 340), describe improvements upon the machine of Patent No. 320,241. They all make expanded metal by simultaneously slitting and bending portions of a plate or sheet of metal and then simultaneously slitting and bending it in places alternate to the first mentioned portions.

Defendant's witness White says (p. 232):

> "The underlying principle of all the patents or so-called methods for the production of expanded metal, is the making of the cuts in alternate position. * * * It is true that in the machine employed for carrying out the so-called method of patent No. 320,242, the metal is fed obliquely to the cutter, but notwithstanding this oblique feeding, the machine makes cuts and opens out the metal, and then, back of these

cuts, in places alternate to the first cuts, it makes other cuts opening out the cut portions of the metal, at the same time stretching the metal somewhat, and thus forming expanded metal."

The only defect of these machines is that the arrangement of the knives renders them difficult to keep in order, especially when used to cut sheet metal of heavy gauge, but they had the advantage of being able to make metal of large mesh from sheets of light gauge without breaking the strands, which machines operating as described in the patent in suit cannot do (Kennedy, pp. 201, 202). The patentee, Golding, says concerning the machine and method of the Golding-Durkee patent No. 320,341 (Rec., p. 106):

> "This process and machine I found had serious limitations, as the form of the cutters was necessarily such as to have fragile points both top and bottom, and were therefore liable to break off when used upon sheet steel of a greater thickness than a sixteenth of an inch, except the cutters were made as described in patent No. 320,241, patented June 16, 1885, in which case the cutters overlapped each other, but by so doing their thickness determined the width of the strand to be cut, and a new set of cutters and readjustment of parts of the machine would be necessary to cut various widths of strands. The cutters in patent No. 381,231, patented April 17, 1885, were also limited to the cutting of one width of strand, except the angles of the cutters were changed. If their faces were turned so as to nearly represent one straight line, the strands to be cut, would be very narrow, whereas if they were set so as to represent a number of parallel lines these strands could be made of greater or less width, but this would require changing the holders of the cutters and also the guiding device, which had always to direct the metal on the angle at which the faces of the cutters were set in the machine.
>
> "*The limitations referred to in this machine* caused me to seek for some other process for the manufacture of expanded metal." (Italics not in the original.)

The special significance of this answer is that it shows that the defect was in the Golding-Durkee *machine;* it was corrected by

improvements in the *machine;* and it had nothing to do with *method or process.*

The Golding-Durkee machine had a large commercial success, and is still largely used. We cite the testimony bearing upon this point later in the brief, for it shows the error of the finding of the Court of Appeals that the patent in suit has achieved such success as to "supplant all previous results"; and for the present we quote only the testimony of defendant's witness Kennedy (Record, page 201):

> "The expanded metal companies of this country have made and are making a large amount of expanded metal on these older machines, especially in the lighter gauges used for lathing."

To sum up the prior state of the art as we have described it above, it is shown by the Record that the manufacture of expanded metal as set forth in the British Patent of Long in 1862, and in the first patent of Golding and the English patent of Johnson, involved the alternate slitting of the metal sheet in parallel lines and the opening of the strands so formed, and that the opening of the strands by pulling them out from the corner of the sheet caused the sheet to contract somewhat in width while it increased much more greatly in length; that the Golding Patent No. 320,240 proposed to open or expand the slitted sheet by bending the strands down at right angles to the sheet "*line after line successively,*" which would necessarily stretch the metal of which the strands were composed, and would not contract the width of the sheet; that in order to avoid the stretching which, if the metal sheet was of thin gauge, would tear the strands, Golding jointly with Durkee devised the complex machine of the Patent No. 320,241 which, with stepped upper knives and shifting lower knives, would cut and simultaneously open the strands without stretching the metal of which the strands were composed.

Golding's Patent in Suit, and the Companion Machine Patent, No. 581,713.

Golding contends that the invention of the machine for the practice of the operations of the patent in suit was later in date than the invention of the so-called method. This is a mere question of the sequence of Golding's mental operations and, as it is solely within his knowledge, the real facts are hardly susceptible of proof; but we submit that it is quite irrelevant. It is certain that Golding must first have conceived the plan of the machine and designed the cutters which he purposed to apply to the blank. This is really what the alleged process claim states. Nothing could have been left except the comparatively simple work of organizing a commercial machine having the required timing and motion. Indeed, it is difficult to conceive of the mental conception of the subject of the patent in suit independently of mechanical means for carrying it into effect. And that, in substance, is what happens in the designing of every improvement in mechanism. The inventor first conceives the principle of operation of the mechanism, and then clothes it in the mechanical form in which it finds expression in the finished machine. Complainant's argument in this regard would serve to convert all patents for new machines into patents for processes because the principle of the machine is conceived prior to the organization of cams, levers and cogs. To elucidate this proposition further produces mental confusion, for if the inventor of a machine does not first have a conception of its principle of operation he must be assumed to develop his machine without knowing at all what he is doing or what end he is seeking.

The machine of the patent in suit was developed to meet the increase of the use of expanded metal for the purpose of reinforcing concrete structures and the demand occasioned thereby for expanded metal made from *thick* sheets. The Golding-Durkee machine could not be used conveniently for expanding thick sheets. The complicated arrangement of stepped upper knives and shifting lower knives, devised for the purpose of lessening the stretching of the thin metal of which expanded metal was formerly made, was inconvenient to keep in order when used for cutting the thicker metal; but on the other hand thick metal will stand much greater stretching than thin metal without rupture, so that the complex arrange-

ment of knives of the earlier machine was not necessary when thick metal was treated. Therefore, as defendant's witness Kennedy shows on pages 198-199, Golding reverted to the simple idea of opening the sheet "line after line successively," and devised a machine having a cutter with a straight row of knives, arranged in a straight line like the knives of the cutter bar of a mowing machine, which in reciprocating would at each stroke cut and open a continuous line of strands, and at the next stroke (the knives being meanwhile shifted endwise) would slit and open a continuous line of strands in alternate positions—a true line after line successive operation. This necessarily stretched the metal strands in opening them, but the stretching, though disadvantageous, as we shall show, was not fatal, for the thick metal would stand stretching without rupture, and the harmful stresses produced by the stretching could be cured by a subsequent annealing of the sheet. The point was that the knives acting vertically in straight lines were strong and would cut heavy metal. They made a good *machine*. The purpose, or at least the effect of the patent in suit is to cover the function or mode of operation of this machine, and thus to monopolize, not only the machine itself, but all other machines, whether invented by Golding or not, which have the same function or mode of operation.

Golding's last machine is shown and claimed in his Patent No. 581,713 of 1897 (Record, p. 424). It is the machine whose mode of use is claimed in the patent in suit. We will now explain its principle of operation and why it is that in its use the strands of the metal are stretched.

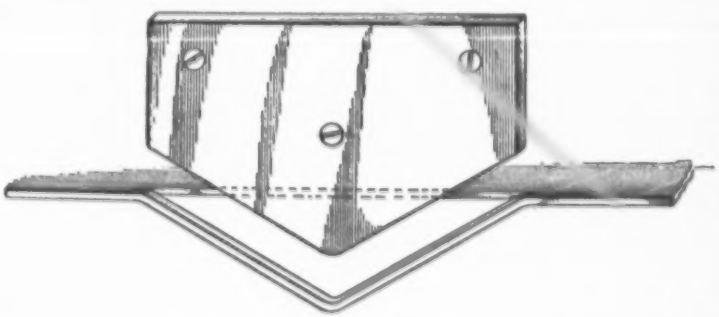
The drawing on page 13 of this brief shows how the machine of the Golding and Durkee patent (granted prior to the date of the patent in suit) was adapted, in cutting and opening the alternately slitted strands, to permit the metal to swing down from the corner of the blank, and thus to lessen the stretching of the strands themselves.

This motion of the strands is possible by reason of the lateral edgewise motion of the lower knives as the upper knives descend. We have already quoted the testimony of Golding to the effect that the difficulty with these machines was that their knives were hard to keep in order when cutting heavy metal. All that is involved in the patent in suit and in Golding's companion patent, No. 581,713, is the substitution in the machine of a different kind of knife from

that described above. This appears from the testimony of Golding, on page 107, where he says (italics ours) :

> "I found by experimenting with a cold chisel, having its cutting end shaped similar to half of a diamond mesh, as shown on the last series of cuts in A, Fig. 1 of patent 527,-242, patented October 9th, 1894, that I could work thicker metal than by the process of the other patents described, and that the results produced a finished article of the same length as the original sheet, due to the fact that the strands forming the meshes were elongated and that the pressure imposed by cutters so formed had the effect of giving perfect alignment to the strands, and produced altogether a more acceptable article. My first experiment with a cutter put into a power machine showed that the cutting of the second series of cuts somewhat distorted the lines of metal which had already been cut, *but it was evident that if all the cuts necessarily in the length of the sheet were made at a single stroke of the machine, there would be no distortion of the metal already cut.*"

Clearly, this was the conception of a mechanism, not of a method, for the testimony of Golding which we have quoted above. means that, for the purpose of working thicker metal, he provided his machine with a new kind of cutter, and this new cutter is shown in the following illustration :



This illustration shows the knife in the act of descending and slitting and opening a strand of metal, and by reason of the shape of the knife, which moves in a straight vertical line and operates upon the metal at a middle point and on two sides, the metal strand

must necessarily stretch while it is being opened into triangular form. A line of these cutters set end to end on a cutter bar and operating simultaneously will slit and open a continuous line of strands, and by repeated operations upon the sheet, will slit and open such strands, *line after line successively*. It is the law of operation of a machine when organized in this way, to slit and open line after line, and to stretch the metal in opening it. This stretching is the function and consequence and law of operation of the particular mode of operation of such knives; and this is admitted by Golding, the patentee, in his testimony in the Bradford suit, where he says, on page 24 of the record in that case:

> "The constant pressure of the cutter which performs these acts (cutting and forcing down the strands) insures the metal being uniformly pressed, bent and stretched to its finished position."

It is also the necessary consequence of the use of cutters of this kind that, because they stretch the strands of the meshes, the finished expanded sheet must be of the same width as the original sheet or blank from which it is made. This is obviously an inherent necessity in the use of knives of this kind and is admitted to be such by Golding, the patentee, who says, on page 107 of the record:

> "As previously stated, the finished sheet was practically the same length as the blank sheet from which it was cut. This is an *inherent necessity*, for the reason that the machine makes one-half of a mesh at each cut, and the strands forming such half-mesh are rigidly fixed to the metal which forms the intersections of the strands and which remain a part of the whole uncut sheet until the next half diamond, behind it and breaking joint with it, is produced."

It will now be apparent what is the real question involved in this case. We have seen that, by the mode of operation described in Golding's Patent No. 320,240, where the slitted sheet of metal was opened line after line successively, the opening of the meshes could not be done without necessarily stretching the sheet; that in order to enable the manufacture of expanded metal from thin sheets which would not stand much stretching, Golding and Durkee devised

the complicated mechanism of Patent No. 320,241 with stepped upper knives and edgewise moving lower knives, and that when the demand arose for the use of expanded metal made of heavy sheets which would stand a considerable degree of stretching, Golding reverted to his original plan of opening the strands line after line, and used simple vertically moving triangular knives which, in their operation, would necessarily stretch the metal.

He now, by the patent in suit, endeavors to prevent the use of any such knives, and in fact to prevent the practice of the method or mode of operation described in his expired Patent No. 320,240, by claiming the result or function of stretching which must necessarily follow the practice of that mode of operation or the use of that kind of knife.

The whole question is one of machinery. This is illustrated, by the following two extracts from the record, the first being an extract from the testimony of Golding with reference to the machine of his Patent No. 320,242, and the second being an extract from the testimony of defendant's witness, Kennedy, in which he compares the mechanism of the patent in suit with the mechanism of the Golding-Durkee prior Patents Nos. 320,241 and 320,242.

Golding says on page 99 of the Record:

> " it not *being possible by the machinery built* to carry out the process of patent 320,242 to make expanded metal of sufficient strength to carry long span concrete work. We never could use steel plates of above a sixteenth of an inch in thickness. This was due to the necessary *shape of the cutters, causing them* to be thin at one point, and for the further reason that part of the metal to be slit had by this process already been cut away from the plane of the plate, and only a thin, wide strand would maintain itself in position while such slitting was made."

Defendant's witness, Kennedy, says on pages 201, 202 of the Record:

> " The machine described in the patent in suit is better than the older machine, because it is much simpler and easier to construct. The knife engages the sheet from end to end and the lower knife is a perfectly plain, straight shear blade which can be made of any thickness desired, and

the upper knives may also be made of any thickness desired. The width of the strand can be varied by merely changing the feed, whereas in the old machines the knives had to be changed or the inclination varied. Moreover, as the knife acts simultaneously from end to end of the blank, it produces a more accurately uniform size of mesh. In the old Golding machine the lower knives travel endwise at the same time that the metal is being cut over their edge, making it very difficult to maintain in perfect adjustment. *These are all mechanical advantages due to the use of a better machine and have nothing whatever to do with any new process or method.* Another advantage is that the cutters can more easily be ground and their shape better maintained than in the older machine." (Italics ours).

See, also, the testimony of White, Rec., pp. 215, 216.

The Ohl Patent.

There is another important fact which should be considered in this connection. Not only is it true that the effect of the patent in suit is to cover the result or function of a cutter of the kind above described when applied to the manufacture of expanded metal by the old process of making expanded metal which was set forth in the Long patent, but it is also true that this kind of cutter, operating on sheet metal to slit, open and stretch it, was old and well known in the art. It is shown and described fully in the patent of Ohl, No. 475,700, dated May 24, 1892.

The Ohl patent discloses a machine which simultaneously slits and bends and stretches portions of a sheet to make metallic lath.

The Ohl patent belongs to the same art as the patent in suit, for an important use of the complainant's expanded metal product is its use as metallic lathing. Eighty per cent. of the expanded metal produced in this country is used for that purpose (p. 211). Ohl's purpose was to manufacture metallic lath. He made it from sheet metal, which was slit by means of cutters and the slit portions bent down into arc form and stretched during the bending operation so as to form projecting keys to receive and engage the plaster. The slitting and stretching of the metal was described in the Ohl specification as follows (Record, page 395) :

"The apparatus herein described is adapted to form slots in a sheet of thin metal with strips attached at both ends to

the sheet behind the slot to form a metallic lath to retain plaster upon walls; * * * (p. 1, line 9).

"These strips are formed by sustaining the sheet over suitable recesses and shearing the edges of the strip from the sheet, *at the same time stretching the strip longitudinally* and bending it into a curve below the aperture as shown in Fig. 11" (p. 1, line 37).

"*stretching it* (the strip) *longitudinally* and shaping it as desired" (p. 1, lines 81, 82).

Like the machine of the patent in suit, therefore, Ohl's apparatus simultaneously slits and bends portions of the plate or sheet of metal, and in such manner as to stretch or elongate the strands connecting the unslitted portions or body of the sheet.



The foregoing drawing is taken from the patent of Ohl and represents a sheet of metal whose slitted portions have been opened and stretched, as described by Ohl.

Ohl's machine has been put into commercial use (Rec. pp. 75–76) and like the machine of the patent in suit, Ohl's apparatus simultaneously slits and bends portions of the plate or sheet of metal in such a manner as to *stretch* or *elongate* the strands connecting the unslit portions or body of the sheet. It completely negatives Golding's claim to novelty in stretching the metal, for it shows that, independently of the stretching of metal which Golding himself had done in the working of his previous patents, *the stretching of slitted metallic strands, by an operation simultaneous with the slitting, and in the manufacture of this same class of material*, was a known part of the art.

The Ohl Patent derives significance from the fact that it was cited by the Examiner in the Patent Office against claim 1 of the application for the patent in suit, which was the only claim originally presented by Golding and was as follows (Record, p. 128):

> "The improvement in the art of manufacturing expanded metal, consisting in simultaneously slitting the sheet and stretching the severed portions."

This claim being rejected by reference to the patent of Ohl (Record, p. 129), was cancelled (Record, p. 130) and the patent was accepted with the claim now contained in it. This action of the patentee persuasively indicates a recognition on his part that the Ohl patent rendered it impossible to obtain a valid claim for the manufacture of expanded metal by simultaneously slitting the sheet and stretching the slitted portions. This admission seems to us to be fatal to the validity of the patent in suit, for it admits the very essence of the claim to be old. All the other steps of the claim in suit were, as we have seen, the steps which had ordinarily and necessarily been practiced previously in the manufacture of expanded metal; and the Ohl patent, as indicated by the action in the Patent Office to which we have just referred, shows that all that the patentee Golding has added to the old steps of making expanded metal, namely, the use of a knife of a kind which, in slitting and opening the strands, will necessarily stretch them, was old in the patent of Ohl in this very art. The complainant replies, in the testimony of its expert and in the argument, that the Ohl patent does not anticipate the patent in suit because it does not make the kind of expanded metal contemplated by Golding's patent, and therefore that it does not exhibit all the steps of the operation recited in the claim; but in making this argument the complainant misses the force of the Ohl patent and fails to take account of the fact that all the steps of making expanded metal recited in the claim were old, that the claim must depend for its validity upon the practice of those old steps by the use of knives which stretch, and that such knives were shown in the patent of Ohl. It follows from this that the patent is void for lack of substantial novelty of method. All that it involves is the substitution of an old apparatus in the practice of an old method, and this certainly does not constitute a novel method. It will be noticed by reference to the Ohl patent that the cutters are not mounted upon a vertically reciprocating head, as are the cutters shown in the patent in suit, but are mounted on a rotary cylinder or roll, under which the metal to be slit and opened passes. This, however, does not constitute a distinction of which the complainant can avail itself, for it is a distinction of apparatus, not of method, and it is the same kind of apparatus that is used by the defendant in the suit of this complainant against Bradford and others and is charged therein to infringe the patent in suit.

Defendant's witness Kennedy says (Record, p. 202):

> "The patent to Ohl, No. 475,700, showed clearly and conclusively that cuts could be made in straight lines across the plate and the metal stretched, or, at least, that Ohl thought so, and the fact that his machine was successful was proof positive that this could be done. Therefore, although a new machine to do this may have possessed great merit, it could not be said to involve any principle new in the art."

The specification of the patent in suit, No. 527,242, contains a statement that the product is old, and predicates the novelty upon the stretching of the metal strands simultaneously with the slitting and bending. But this was old and unpatentable and is admitted to be so.

The patent in suit begins with a recital that expanded metal was old, that the methods of making it by slitting and opening sheet metal, or by simultaneously slitting and opening sheet metal by means of stepped cutters, were old; that the patentee purposes to make the old product; and that the invention consists in simultaneously cutting and opening and stretching the metal. The specification states (Record, page 409):

> "In the manufacture of what is now generally known as expanded sheet metal, it has been customary to first cut the slits in the sheet metal at short distances apart, and to open the metal at the cuts thus formed by bending the severed portions or strands in a direction at right angles substantially to the plane of the sheet. It has also been made by simultaneously cutting and opening the metal by means of cutters set off or stepped relatively so as to make the slashes or cuts in different lines in the manner set forth in patents No. 381,230 or No. 381,231, of April 17, 1888. In both of these methods the product is somewhat shorter and materially wider than the original sheet, but practically no stretching or elongation of the metal forming the strands is caused.
>
> "In my present invention I seek to avail myself of the ability of the metal to stretch or distend as well as of its ability to bend under strain or pressure, and the invention

consists in the improved method of making expanded metal, viz., by simultaneously cutting and opening or expanding the metal at the cuts by stretching the severed portions."

The foregoing statement that it was old to make expanded metal by means of *stepped cutters* would seem to indicate a recognition that the real distinguishing feature of the patent resides in the cutting mechanism and not in any novel *process*, and although this is followed with a statement that the prior practices resulted in shortening the sheet, yet this is of no force in view of the fact, as we have shown and as Golding admits, that stretching is a mere result or function of the cutters. The statement that the patentee *avails* himself of the ability of the metal to stretch, disproves that the invention could have consisted in a discovery that the metal could be stretched.

The definition of the invention quoted above from the specification is that the improved method consists in "simultaneously cutting and opening or expanding the metal at the cuts by stretching the severed portions."

We have shown above, that in the proceedings in the Patent Office the patentee admitted the steps recited in this definition to have been old ; and that like admissions have been made by counsel in this litigation. Indeed on page 81 of his brief, complainant's counsel admits that "the operation of simultaneously cutting and bending metal so as to stretch the strands was old." But these admissions virtually concede the invalidity of the patent, for the steps admitted to be old are the very steps which are stated in the specification to define the invention, and the addition which complainant seeks to make to this definition—namely the repetition of these steps over and over again, line after line successively—really adds nothing of substance for it is not in the claim of the patent and it is not new. Expanded metal has always been made by a repetition of such steps, and this is illustrated in detail in the prior patents of Golding and Durkee.

The patent in suit then proceeds to describe how the invention is to be carried into effect, and in stating that the patentee *prefers* "to make a series of slits in a straight line across the edge of the sheet," the specification renders impossible the argument which has been advanced by the complainant and seems to have been adopted by the Court of Appeals for the Sixth Circuit, that the straight line of slits is a distinguishing feature of the invention

claimed. A "preferred" operation—one that can be used or not as desired, and is not incorporated by express terms in the claim—cannot be regarded as essential to the invention. *Olin vs. Timken*, 155 U. S., 141, 146, 147. And by bringing suit against Bradford, who used a machine which forms cuts in diagonal series and not in straight lines, complainant has emphasized the intention to cover broadly the stretching of the metal while practicing the old method of making expanded metal, and the intention not to be limited to the use of the preferred straight line of cuts. Indeed, to limit the claim to the making of the cuts in a straight line would only emphasize the invalidity of the claim, for the making of the cuts in a straight line does not pertain to a method, but simply to the use of a cutter having knives arranged in a straight line and of particular form.

The language of the specification is (lines 34–47):

> "In the practice of the invention *I prefer* to made a series of slits in a straight line across the edge of the sheet, and at the time of cutting the slits and as a continuation of that operation to depress or stretch the severed metal, *i. e.*, those portions of the sheets lying outside of the cuts, in a direction at right angles to the sheet, without any contraction from the length of the original sheet. This operation is then repeated after the sheet has been fed forward, the slits being made opposite the portions unsevered at the previous operation, and so on until the entire sheet is expanded."

The mechanism which the patentee disclosed in the specification and which he illustrated in a rudimentary and general way is illustrated in Figs. 2 and 3 of the drawings, which we here reproduce:

FIG. 3.

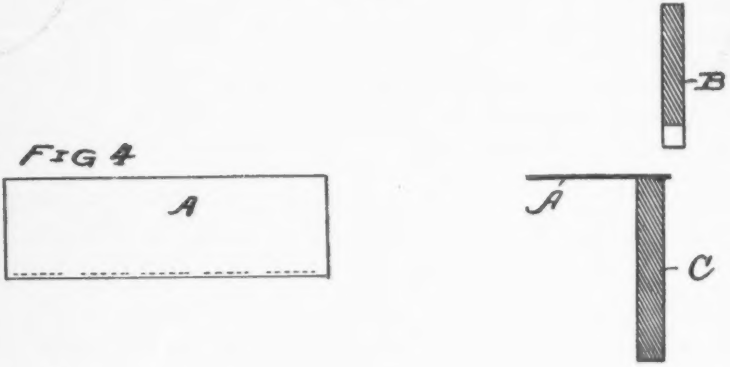
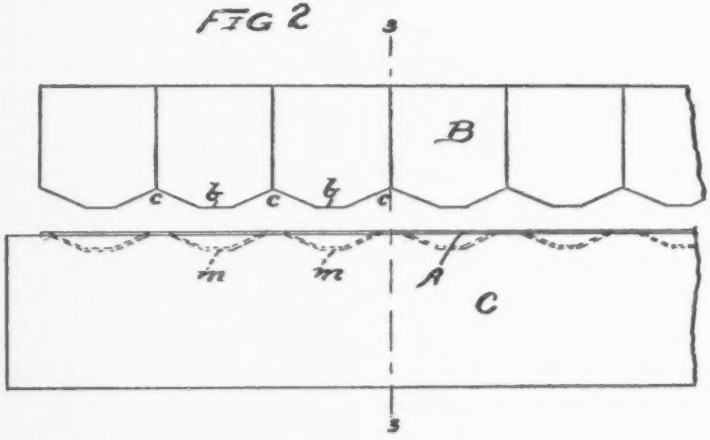
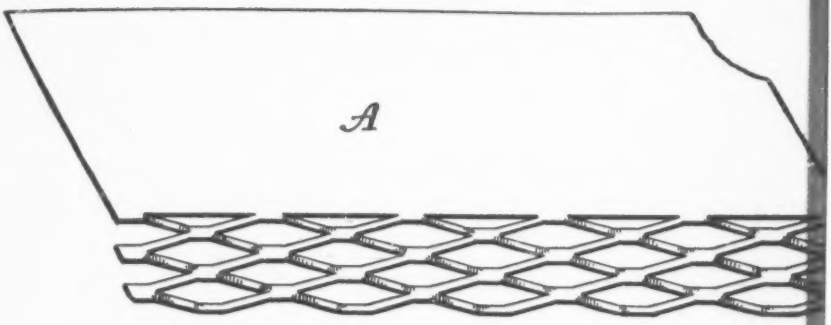


FIG 4

FIG 2



The following is a reproduction of Fig. 1 of the patent in suit showing the product of the machine ; and a comparison of this with the product of the expired patent of Golding No. 297,382, the drawing of which we have reproduced on page 8, shows that so far as the product is concerned the patent in suit has no substantial novelty.



In describing the practice of the invention the specification states, on line 48 :

> " My invention allows the use of a single straight under knife, which, of course, does not need to be shifted in changing the location of the cuts, and the upper cutters are also arranged in a straight line, but their acting edges represent a corrugated form of alternate transverse projections and recesses adapted to coact with the under knife in cutting the slits at the proper intervals and to stretch the severed strands, and either the upper cutter or the sheet is shifted back and forth between the operations, as will be understood."

The specification also describes the peculiar characteristics which the cutters must possess in order to enable them to produce the desired result, as follows (line 73) :

> " The lower edges of the cutters B are so shaped as to form alternate transverse projections *b* and recesses or intervening openings *c*, the projecting portions being adapted to coact with the lower knife in forming the slits. They are also adapted to force or carry downward the severed portions of the metal at the same operation to the position indicated by the broken lines *m* at Fig. 2."

The obvious function of the cutters thus described is to form a straight line of slits and by the mere act of the mechanism to depress the slits into a sinuous form.

The specification states:

> "One line of slits across the sheet is formed at each operation, and the upper cutters, or the sheet, may be shifted and the sheet be fed forward between the operations so that the slits are in every case made back of the portions left unsevered at the preceding operation, or in other words the slits and unsevered portions alternate in position at successive operations."

The operation described in the foregoing language is the operation of the machine according to which the patentee *preferred* to practice his invention; not the invention itself, but the preferred embodiment of it, namely, by making the slits simultaneously in a straight line along the edge of the sheet and effecting the required alternation of the slits by shifting the knives or shifting the sheet between each stroke of the machine.

The claim of the patent is as follows:

> "The herein described method of making open or reticulated metal work, which consists in simultaneously slitting and bending portions of a plate or sheet of metal in such manner as to stretch or elongate the bars connecting the slit portions and body of the sheet or plate, and then similarly slitting and bending in places alternate to the first mentioned portions, thus producing the finished expanded sheet metal of the same length as that of the original sheet or plate, substantially as described."

The last clause of the claim beginning with the word "thus" and relating to the dimension of the finished sheet, is not a part of a method or mode of operation, but is the mere statement of a *result*. The proofs to which we have already referred and which we will cite more fully later in the brief show that it is indeed the necessary result of the use of knives of a certain character and therefore purely a mechanical function of such knives.

Nothing is said in this claim as to whether the slits are to be made in a straight line or in an oblique line; or whether the metal sheet to be operated on is presented to the machine by a straight feed or an oblique feed; or whether the line of cuts made by each operation of the machine is a straight line extending from one end of the

sheet to the other end; or whether the sheet is to be attacked first from the side or the end; or whether the meshes made by each operation of the machine are to be of any particular form. In brief, the claim attempts to cover broadly in connection with stretching, the familiar steps of making slits and then making additional slits in alternate position to the slits previously made, the stretching and bending of the metal to be simultaneous with the cutting and bending. Golding in fact patented the stretching in connection with the making of the old repeated alternate cuts; and since expanded metal cannot be made without the repeated alternate cuts, the claim is in effect a claim for the stretching of metal. As Judge DALLAS stated in the opinion of the Court of Appeals for the Third Circuit, the claim is so broad that no matter how the stretching is effected, it purports to cover the principle of stretching in the manufacture of expanded metal; and this is confirmed by the very diverse characters of the alleged infringing apparatus in the two suits now pending before this court on *certiorari*.

The description of the mechanism contained in the patent in suit is of a vague and general nature, and it justifies the criticism that all that is disclosed in the specification which is capable of being patented, namely, the mechanism by which the operation is performed, is described so vaguely as not to give to the public the detailed information which is required by the patent statute. The showing of the machine is fragmentary and diagrammatic and the mechanism was not fully or adequately described until the grant of a second patent to Golding on May 4, 1897, No. 581,713 (Record, p. 425) Reference to this patent will show that the machine is a complex organization involving many essential parts—mechanism for holding and operating the knives, mechanism for guiding the sheet, and mechanism for shifting the knives between each cut so as to make the required alternation of cuts. The machine in question operates with a guillotine movement like the Golding & Durkee machine of the prior patents. The cutting and expanding mechanism consists of a straight row of upper cutters coacting with an under cutting die on the edge of the bed plate. These cutting parts, which are simple enough, are connected with elaborate mechanism for holding the metal rigidly in place and at the same time causing it to move forward between the strokes. Other parts are provided to insure perfect alignment of the different rows of cuts relative to one another, and the whole includes such things as treadles, eccentrics, cams, gears, rollers, pins, fillets,

frames, guides, springs, notched bars, movable bars, presser bars, brackets, pivotally connected arms, rock shafts, levers, etc.

The specification contains a description of the manner in which the machine is to be worked by the operator. This description gives an idea of the character and extent of the mechanism. It negatives the suggestion that any ordinary metal cutting machine could be used to practice the alleged process.

The first and second claims of patent No. 581,713 cover the mechanism which Golding invented, and it is a significant fact that no charge of infringement of that patent is made against the defendant. On the contrary defendant's witness White says that the steps of the defendant's machine are substantially the steps of the machine of the expired patents of Golding and Durkee, No. 320,242 and No. 381,230. Mr. White's testimony on this point (p. 238) is :

> "And the fact is, we organized into a machine the same steps as are shown in these patents, using in our machine a knife adapted to give the mesh the form of a perfect diamond. The patents referred to covering machines show an oblique feed for the metal, this oblique feed being adapted to meet the oblique arrangement of the knives. We simplified our machine by changing the feed, but the steps are substantially the steps shown in these machines, referred to by these patents."

The claims of the machine patent in question, No. 581,713, are :

> "1. In a machine for forming expanded sheet metal, the combination with a laterally-shifting support for the sheet, an upper vertically-moving cutter and a lower stationary cutter, said cutters being adapted to slit and simultaneously stretch the metal, of devices for feeding the sheet acting upon the expanded portion thereof, substantially as specified.
>
> "2. In a machine for forming expanded sheet metal, the combination with cutters acting to slit and simultaneously stretch the metal as set forth, of devices for feeding the sheet and adapted to act upon the expanded portion thereof, devices for engaging the sheet and serving to regulate the feed, and means for shifting the sheet, substantially as specified."

The Invention, if any, resided solely in the Machine.

All patentable subject matter in the processes now used for making expanded metal was exhausted years before the patent in suit.

It may be that the British patentee Long invented a patentable process when he discovered that a new product—expanded metal—could be produced by slitting a metal sheet with lines of alternately placed slits and opening the slitted portions by transverse displacement of the strands. Long may have been said to have combined a new series of steps by which a sheet of metal is transformed into a new product; but when Long's process was disclosed, all that remained to be done to commercialize it, was to invent a machine for carrying it into effect. Many machines might be devised, and the record shows that many were devised for this purpose. Johnson used a "former or mould" over which the slitted sheet was pulled (Rec., p. 266); Golding in his patent No. 320,240, suggested, without particularly describing, means for opening the strands, "line after line successively"; Golding & Durkee, in their patents No. 320,241, No. 320,242 and No. 381,230, described machines with stepped knives which slitted and opened the strands simultaneously; Golding in the patent in suit and in the companion patent No. 581,713, described a machine having vertically moving triangular knives with means for shifting the knives or shifting the sheet edgewise between the cuts Bradford, the defendant in the suit in the Third Circuit, invented a machine provided with rotary cutters operating upon the sheet with oblique lines of cuts; the defendant in the case at bar has also devised a machine, different from Golding's, which does not infringe the claims of Golding's machine patent. Each of these eight machines has its own peculiar law or mode of operation—all new machines have to some extent new principles and new modes of operation; yet it would be manifestly absurd to say that the use of each involves a new and distinctive process. The simple fact is that all practice one and the same process, *i. e.*, the process of making expanded metal by slitting a sheet with rows of alternate slits and opening the slitted strands into meshes; and the differences between them are differences in mechanism and in the modes of mechanical operation which are inherent in the different mechanisms. Otherwise, instead of one valid process in this art, there would be as many patentable processes as there are machines.

Each patent for a machine would have as its companion a valid patent for the mode of operation or function of the machine, and the consequence would be an absurdity.

The foregoing argument is in accordance with the testimony.

Defendant's witness Kennedy, an engineer of experience in the treatment of metals, says (Rec., p. 200):

> "There is no process described in the patent in suit which is substantially different from what is described in the earlier patents. Both machines simultaneously cut and expand the metal by a series of alternate cuts, the alternations being caused in the earlier machines by feeding the sheet obliquely and being caused in the later machine by shifting the knives between the cuts or shifting the sheet relatively to the knife. Both machines stretch the metal, the later machine stretching the metal on both sides of the point of cutting knife, and to a greater extent than the earlier machine, which stretched the metal on one side only of the point of the knife. Of course, the operative effects of the machines employed are somewhat different, because in the earlier machines the cutters were oblique to the line of feed; whereas, in the machine of the patent in suit the cutters are set at right angles to the line of feed. This, of course, constitutes a difference in mechanism, and the older machines would work on some classes of material better than the new one will; although, where the material is suitable for being worked on the new machine, the latter is a simpler and better one, and the arrangement of the knives keeps the metal more readily under control. I see nothing here, however, which could be called a new process; merely a difference in machines."

On page 203 Kennedy says:

> "Each of the machines simultaneously slits, bends and stretches the metal. It is true that one stretches it more than the other, and one machine has simpler knives than the other; in one the sheet is fed in diagonally and in the other straight; but I should judge that a man might invent a dozen of machines, and if each would slit, bend and stretch the metal simultaneously, even if each fed the sheet

in in a different direction, and if each differed from all of the others in the shape of the knives, in the percentage of stretch given to the steel strand, in the method of operating the feed and of operating the knives, I do not believe that there could be said to be any difference in method involved in any one of them, other than a mere difference in the machine. One might be simpler than another; one might be easier to keep in repair than another; one might do nicer work with less torture to the steel going through it; but these would be simply good points in the machines, and might entitle the inventor to a patent for them, but they certainly would not create the presumption of any new method in the art."

Kennedy says further, on page 203:

"The patent in suit seems to be an attempt to cover the function of a guillotine machine, the knives of which are set in a row and operate in a straight line across the sheet instead of operating in a zig-zag fashion, the result of which is simply to produce a product which is different from the product of the diagonal feed machines for the same reason that many new machines produce a better product than older and more complicated machines without involving anything which could in the slighest degree resemble a difference in method or process. Because one man has invented a machine which will shear a plate of steel and give a certain percentage of stretch at the same operation, it would seem hardly fair to say that no one else should be allowed to invent another machine to accomplish the same result, the work of the machine being purely mechanical and confined to changing the form of a sheet of metal, the resultant product being something which is old in the art."

Complainant's witnesses admit that the stretching of the strands in the manufacture of expanded metal of the kind described in the patent is a necessary function of the machine in which the metal is produced (Curtis, pp. 88–90), and the same admission is substantially made by complainant's witness Merritt (p. 118, x-Q. 22) who shows that the differences in the product result from a difference of mechanism rather than from a difference of method. Indeed, the

hardly disguised intent of the complainant in this case is to ask an interpretation of the patent which will cover not only the particular mechanism which Golding designed, but all other machines which could be constructed or conceived for the manufacture of a like product (Golding, p. 113, x-Qs. 239, 240).

In a later portion of this brief we will argue on the authority of the decided cases that the steps or elements enumerated in the claim of the patent in suit do not constitute a method or process within the meaning of the law, that is to say, they do not constitute an act, or series of acts, by which the metal is transformed into a different *state or thing* (Cochrane vs. Deemer, 94 U. S., 780). The thing produced is merely an old article—a sheet of expanded metal. The only change is in its *shape*—just such a change as is produced when a nail is upset and headed or when a puddle-ball is rolled for the purpose of pressing out the slag. The expanded metal sheet is the same kind of a sheet as was produced by the former machines, better only because it is made on a better machine. Improvement of product does not prove the presence of a patentable method. Improvement of product is a very common characteristic of improved machines; and it affords no justification for an effort by patent to monopolize the manufacture of such improved product.

Stretching of the Strands.

Whether the strands of expanded metal are stretched during their manufacture, and the degree to which they are stretched, is determined by the cutters employed in the machine.

Reference has been made in this brief to the fact that the machines of the expired patents of Golding & Durkee (called in the testimony the machines of the "second process") stretch to a certain extent the metal which forms the strands. H. E. White shows that in making a cut six inches long in a sheet one-eighth inch thick by those machines, the stretching is approximately four per cent. (Rec., p. 212). Stretching is an inherent necessity of the operation of cutting when the ends of the strands are to be left attached to the body of the metal. The degree of stretching depends upon the thickness of the metal, the shape of the knives and the length of their travel, a fact which is made evident by the illustrations below:

FIG. 1.

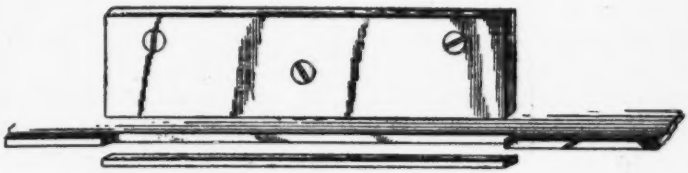


Figure 1 shows a square-edge knife elevated from a sheet which it has acted upon. Such a knife, having square ends, necessarily acts as a punch, and shears away the strand, leaving it without connection at the ends.

If, in order to avoid completely severing the strands, the ends of the knife be rounded as shown in Figure 2, the metal will be stretched before it can be severed.

FIG. 2.

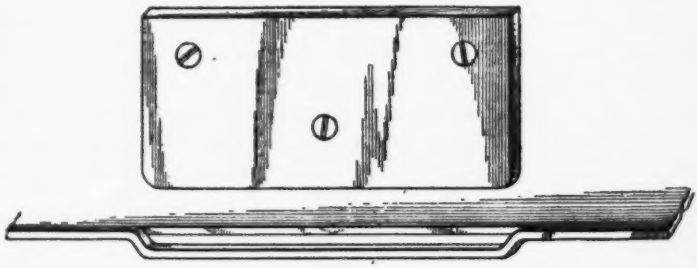


Figure 2 shows that a strand connected at both ends with the blank, has been cut and pressed down without separating it from the sheet. The cut strand must have stretched, for it is now part of a sinuous line which is longer than the original straight line of the metal. The minimum amount of stretching is represented by a knife of the shape shown in Figure 2.

FIG. 3.

Fig. 3.

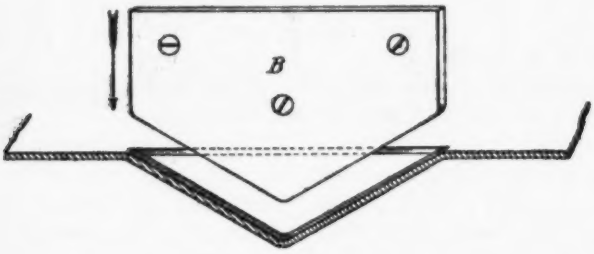
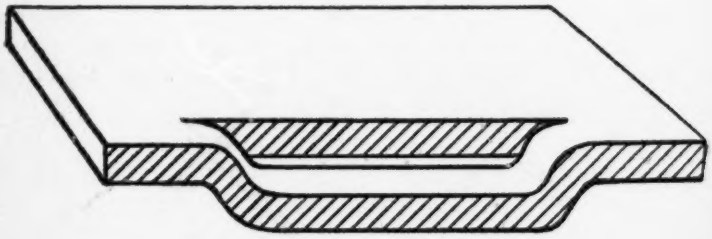


Figure 3 shows a knife of the form used in a machine which operates according to the so-called method of the patent in suit. Such a knife must stretch the metal to a greater degree than a knife of more obtuse form, and when it engages the metal it will stretch the severed portion uniformly from the middle toward the ends as the strand is pressed down. The shearing away of the cut strand will not take place until the angular part of the blade has entirely passed through the sheet. This form of knife stretches the strands of the metal by the same mode of operation and for the same reason that the knives of the Ohl patent stretched the strands, and if a straight row of such knives attack a sheet of metal they must necessarily stretch all the strands which they cut and bend.

The next figure illustrates the prominence of the stretching effect in the slitting of a thick plate of metal.

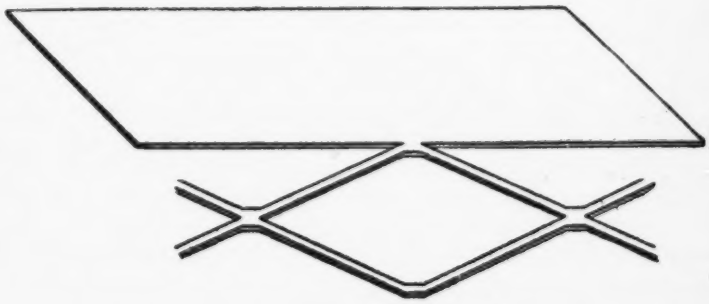
FIG. 5.



It is also plain that although the thicker the sheet, the more metal there is to provide for the stretching, the degree of stretching depends upon the configuration of the meshes. The stretching is invariably attended by a diminution in the thickness of the strand and when carried far enough, the strand breaks. What the strand gains in length it loses in cross-sectional area.

We may readily stretch the strands of a mesh like that shown in the next figure.

FIG. 6.



It is, however, obvious that with the same sheet we could not make a mesh of the configuration shown in the next figure. The inclination of the strand is such that the metal would require the yielding quality of rubber to withstand the great strain.

FIG. 7.

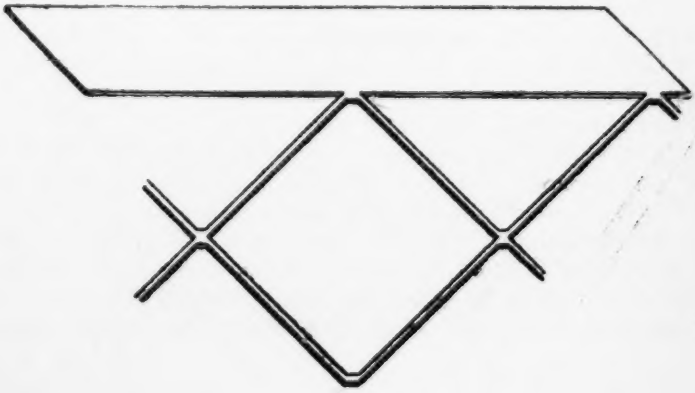


FIG. 8.

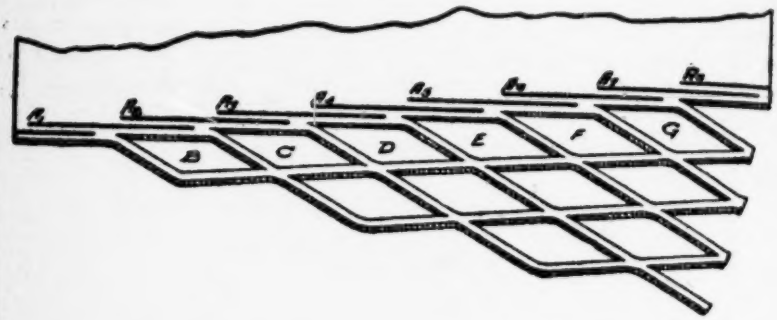
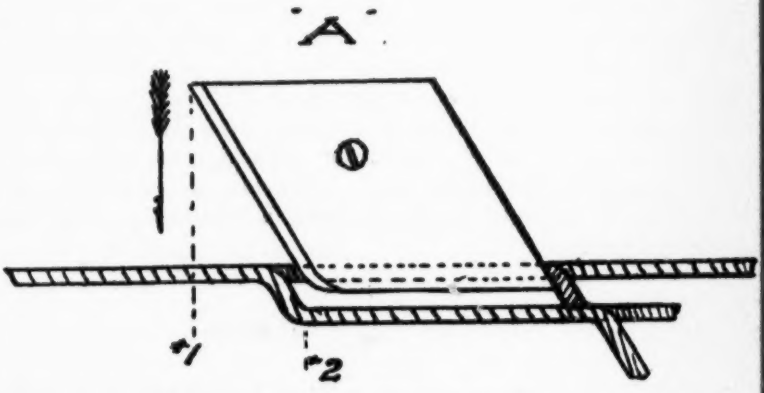


Figure illustrates the steps of the machine of the Golding-Durkee so-called second process patent No. 320,241, and shows how in that machine the metal was cut and opened out by a stroke of the machine and then similarly cut and opened in alternate places by the next stroke of the machine. The figure is reproduced from an illustration in the patent No. 320,242, the straight black lines being added to show where the cuts will be made by the next stroke of the knives. The last stroke made the row of cuts indicated by the letters B C D E F G, but the meshes are not yet complete, for they are still integral with the blank, like the loops of the product of the Ohl patent. The next stroke, however, will cut the metal simultaneously on the dark lines A1, A2, A3, A4, A5, A6, A7 and A8, thus making completed meshes or completed units of the expanded sheet out of the row of loops or incomplete meshes indicated by the letters from B to G. The cuts on the dark lines A1 to A8 alternate in position with the previous cuts, and the *repetition of these steps*, by making cuts and then making cuts back of them in alternate positions, produces the finished meshes in the sheet of expanded metal.

In the operation shown in figure 8 the sheet has been slit and opened out by bending, and then similarly slit and opened out by bending in places alternate to the first-mentioned portions, the two operations combining to make meshes; and it has also been cut and bent in such manner "as to stretch or elongate" the metal forming the strand, as it has been shown that metal strands with their ends attached

cannot be cut without stretching. The amount of stretching is a function of the machine, and is simply a question of degree, depending upon the kind of knife and the arrangement of the knives. The degree of stretching in figure 8 is less than in the operation illustrated in figure 3, because of the difference between the knives used in the two cases, and this is shown by figure 9, which illustrates the construction and mode of operation of the knives used in making the cuts shown in figure 8 (White, Rec., p. 212).

FIG. 9.



Arrow indicates direction of travel.

The knife shown in figure 9 is one of a series of knives which, in the Golding-Durkee Patent No. 320,241, are fixed in stepped or overlapped arrangement. The arrow indicates the direction of travel of the knife blade A. By reason of its oblique shape, as it continues to descend the side of the knife next to the arrow attacks the metal and extends the cut toward the dotted line. The knives located next to the blade A in the stepped row at the same time perform the same operation and thus make a row of cuts. From a study of the illustration it will be readily seen why the knives of this machine make a different cut from the knives of the machine of the so-called process of the patent in suit. The difference is simply a difference in knives—a difference in machines, and the difference of stretching is only a difference of degree. The knife of figure 9 stretches the metal mostly at the beginning of the cut, while

the knife of figure 3 by reason of its arrangement and its V-shape continues to stretch the metal uniformly throughout the cutting operation. But both machines make cuts and open and stretch the metal and then in the next stroke make additional cuts and open out the metal in places alternate to the first cuts, thus forming expanded metal by repetition of the well-known steps.

It is unquestionable that the use of the machines of the Golding & Durkee patents results in stretching the metal strands to an extent which, in making a cut six inches long in a sheet one-eighth inch thick, would be about 4 per cent. (White, p. 212, Q. 10). The maximum stretching produced by the operation of the patent in suit is 12½ per cent. (White, pp. 212, 213, Q. 11), and this is admitted in terms by complainant's witness Hunter (p. 80, x-Qs. 43–45), although complainant's brief exaggerates this stretching and represents it to be from 15 to 20 per cent. The real fact is that the stretching is a matter of degree, the stretching in the use of the Golding & Durkee machine reaching in some cases 4 per cent., and in the use of the apparatus of the patent in suit reaching a maximum of 12½ per cent.

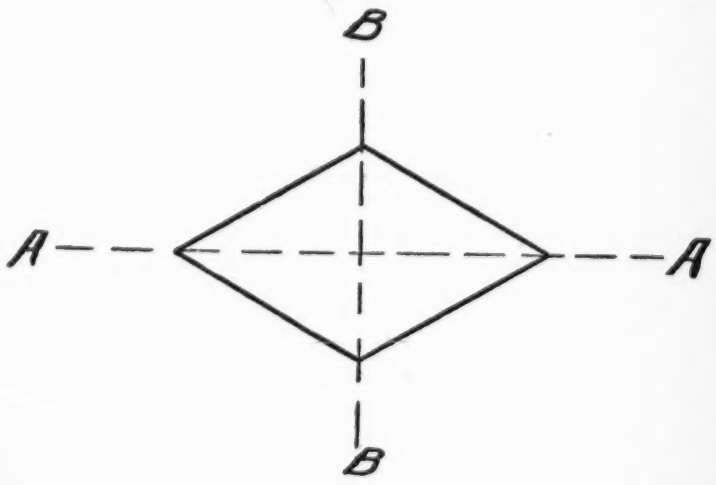
Shortening of the Sheet.

Shortening of the sheet in width as it is expanded in length occurs only to the extent that the strands do not stretch; in other words, if the strands have a maximum stretching of 12½ per cent., the sheet (if it were not for the stretching) would have contracted in width 12½ per cent. and no more. As 12½ per cent. is the maximum stretching of the strands in the use of the apparatus of the patent in suit, the difference between 12½ per cent. and the 4 per cent. stretching characteristic of the Golding-Durkee "second process" machine, which difference is only 8½ per cent., must be the maximum saving of contraction in width which results from such stretching; and it is inexcusable exaggeration for complainant, in its briefs in the Court of Appeals and in this Court, to contend that the saving of contraction amounts to from 15 to 20 per cent. *But even this saving of 8½ per cent. is only apparent, not real. What the sheet loses in one direction it gains in another.*

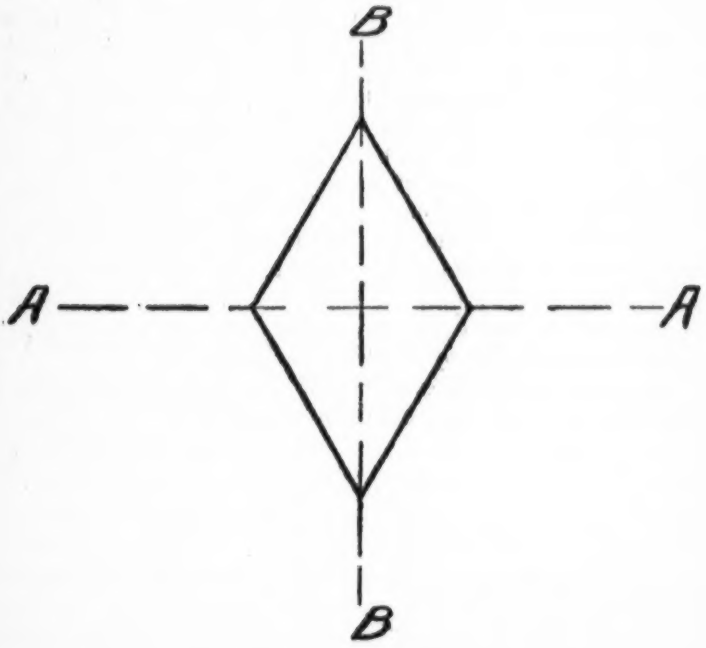
In this case we hear much about the shortening of the sheet as opened by the Golding and Durkee machines. It is put forward as

an evil of magnitude, something that involved a "loss of from fifteen to twenty per cent.," as compared with the sheets that are stretched. In practical effect, however, the loss amounts to nothing. The fallacy is proved by the familiar rule that something cannot be created from nothing. In the first place the stretching involves a reduction in the thickness of the strands so that a heavier blank is required if the stretched strands are to be a given thickness. In the second place the stretching and the shortening are always precisely the same in extent (Kennedy, p. 201, Q. 9). That is to say, if we are to prevent a shortening of ten per cent. in the sheet we must stretch the strands correspondingly. Yet the greatest increase of stretching effected in practice by the complainant is 8½ per cent. The only effect, therefore, of the statement that the shortening causes a loss of 20 per cent., is to confuse the mind and create the wrong impression that the stretching effects a positive saving. This is now made clear by illustrations.

The figure below represent a mesh whose vertical axis is shown by the line B. B. and longitudinal axis by A. A.



The next figure shows the same mesh after it has been shortened by drawing the sides nearer in one direction.



As the axis A. A. shortened, the axis B. B. correspondingly lengthened. The area of the mesh has not changed. What was lost in one direction was gained in another. Nor is there any saving if the elongation of the axis B. B. be lengthened without lessening the axis A. A. In that case the strands must be greatly stretched to permit the elongation of the line B. B., and when we take into account that the stretching involves a diminution in the thickness of the strand, and therefore a weakening of the strand, the gain of area by stretching is not a saving. This is shown by the testimony of defendant's witness Kennedy, who says on page 201, Q. 9:

> "Q. 9. Is it true that by the operation and machine described in the patent in suit any saving of metal is obtained by reason of the increase of area without lateral contraction of the sheet?

"A. No, there would be no saving in metal due to maintaining the area of the sheet, as the metal would have to be thicker to start with, to compensate for the thinning of the metal due to stretching; in other words, to have the same cross-section in the strands the same weight of steel must be used in each case, and you cannot make something out of nothing no matter what machine you used for slitting and bending it. In other words, by the new process, you would get a wider piece of expanded metal from a given width of plate, but the plate itself would have to be thicker in the same proportion, so that there is no economy of metal obtained."

These facts are all obvious, so obvious, indeed, as hardly to call for this explanation, but they appear nevertheless to have been responsible for much confusion.

The fact that the sheet does not contract in width in the operation described in the patent in suit does not constitute a process, for it is a result; and it is not even the result of a process, but simply the consequence or function of using the V-shape knives shown in the patent in suit, which, by depressing the metal into angular strands in vertical lines, compel the strands to stretch and prevent them from contracting in length. Therefore the argument based upon the stretching of the strands and the prevention of the contraction of the sheet is irrelevant, so far as the patentability of the method is concerned, and it simply emphasizes the fact that this characteristic of the patent is not part of a process, but only a function and mode of operation of the machine described in the patent in suit for the practice of the old method which had been previously known in the art.

Injurious Effect of Stretching.

The impossibility of treating the stretching of the strands as a new method rather than as an incident or function of the apparatus, is illustrated by the fact, abundantly proved in the record, that the stretching is not a thing to be desired and is not in itself beneficial. On the contrary, it has an injurious effect upon the metal, and has to be corrected by a subsequent more or less expensive process of

annealing, for by the stretching of the strands under the knives shown in the drawing of the patent in suit they become so strained and brittle that they can be readily broken by hand and would be fractured if a wheelbarrow were drawn across them on the floor. Gunz, p. 159, Q. 38; White, p. 213, Qs. 16–20; Kearns, p. 182, Qs. 44–51; Ham, pp. 226, 227; Kennedy, p. 200, Q. 8.

Mr. White, in the testimony above cited, says that a stretching of even 10 per cent. produces a very harmful effect upon the metal. In answer to Q. 17, page 214, he says:

> "The effect of stretching the metal to this extent is very detrimental, especially when the mesh is to be used for reinforcing concrete. The stretching makes the metal very hard and brittle, so that it cannot be bent to any great extent without breaking it; in fact it frequently will not stand ordinary rough handling of the bundles of sheets such as they would get around a building operation or in transit. It would be very unwise to use steel in this condition for reinforcing concrete, since it might fail absolutely without warning owing to its extremely brittle character. In a great many cases it is as brittle as hardened tool steel. It is for this reason that we make a practice of annealing all of this diamond mesh for reinforcing concrete."

In answer to Q. 20, Mr. White says:

> "Q. 20. Is the stretching ever beneficial in any way?
> "A. No."

Complainant's witness Kearns, who is one of the pioneers in this art, says, on page 182, in answer to Q. 45:

> "The severe stretching it gets in the machine in my opinion makes it very undesirable and in fact dangerous to use in the concrete unless it has been put through this annealing process."

The same witness states on page 183 that architects would not accept this material unless it was annealed and sometimes twice annealed.

Complainant's witness Golding, after contending in his direct examination that the stretching had a beneficial effect upon the

metal of the strands, was forced, on cross-examination, to admit that, prior to the filing of the bill the entire product made by him or his licensees under the patent in suit in the United States was annealed (Golding, p. 111, x-Q. 224). The effect of annealing is to restore the properties lost by the act of stretching. Where the material is light and is intended only to be used for lath, qualities of strength are not necessary and annealing can be dispensed with, but in that case only.

The finding of the Court of Appeals in the case at bar on this point supports the statements which we have made above, for the Court refused to find that the stretching of the metal was beneficial, and, on the contrary, said (Rec., p. 451):

> "It appears from the testimony of experts that the expansion of metal by stretching it does not, within moderate limits, weaken its tensile strength, though it has a tendency to make it more brittle, but not injuriously, if not carried too far."

We submit, as matter of law, that a harmful and unsought-for consequence of the use of a piece of mechanism—and this is all that is involved in the act of stretching—cannot be regarded as a process and thus made into patentable subject matter.

Incorrect statements in complainants' argument.

The complainants endeavor to show patentability in the alleged new process by indicating differences in the mechanism. They argue that the Golding & Durkee machines made full meshes by each stroke, whereas the cutters of the later machine make only half "diamonds" or half meshes. As these alleged differences relate merely to mechanical details, they hardly merit serious attention. We cannot judge of the final result or effect of a machine by stopping at some intermediate stage of the operation to examine the condition or shape of the thing undergoing treatment. The test is the completed product which alone shows the full operative effect.

However, complainants' statements as to the differences which are alleged to exist even at the intermediate stage, are inaccurate and inconsistent with the record. In comparing Ohl's half diamond strands with the strands of expanded metal, complainant

argues that the meshes of Expanded Metal are "*bounded on all* sides by strands" as distinguished from openings partly bounded by the blank. They state that the mesh is not complete until all the strand portion is cut away from the blank. If that is true, then the Golding and Durkee machine did not complete one line of meshes until it made the second stroke, and as a glance at the blank undergoing treatment will show, it leaves the incomplete meshes integral with the blank until the next stroke is made. The truth is that on the first stroke each kind of machine makes partial meshes. Then upon the second strokes each machine finishes the incomplete meshes of the preceding stroke, and leaves additional incomplete meshes for completion by the next stroke. It is seen, therefore, that each machine, excepting upon the first and last strokes, produces the equivalent full meshes. In both cases the cutters of each machine make *half* diamonds at each stroke, but by reason of the staggered cutters of the earlier machine, the half diamond effect of one cutter overlaps the half diamond effect of the adjacent cutter.

In describing the operation of the Golding & Durkee machine, it is stated that it is "essential to the Golding & Durkee process that the metal which forms the outer ends of the strands of any mesh shall be severed from the sheet in widths *equal to the* width of *two finished strands* and that this double width of metal shall be split by the action of the cutters while it is partially free from the main body of the uncut sheet." This statement can only be characterized in one way—it is not in accordance with the facts. The argument founded upon it is therefore worthless. As has been made plain in the illustration of the method, the forward cutter in the stepped row first cuts and bends down the strip. The next adjacent cutter located back of the other cutter referred to, cuts and bends down a one-fourth portion of a strand back of and *along the new edge*—left by the previous operation of the knife in advance of it.

And again in referring to the making of the "complete mesh" by each operation of the Golding & Durkee machine, complainant's brief states, that the alleged new process involves a sacrifice of speed, whereas, the truth is, the new machine possesses greater capacity for the obvious reason that it cuts the metal from end to end at each stroke. The sheet is presented to it by a straight feed, and to the Golding and Durkee machine by an oblique feed, and the difference in favor of the later machine is the difference between

the distance of given points along a straight line and an oblique line.

All this is indeed of no material bearing upon the case, for it is a matter of machine construction and work.

In fact throughout the complainant's presentation of this case, things which are without bearing on the issue are brought forward as matters of transcendent importance. A constantly recurring schedule of so-called reasons swings through complainant's brief with confusing instead of illuminating effect. For example, it is said on page 31 of complainant's brief that the "principal defects" of the Golding and Durkee process (the so-called second process) were:

> "FIRST. The sheet is materially shortened. As has been pointed out, this shortening is often as much as 15 to 20 per cent.; consequently, to produce a sheet of expanded metal of any given length, it is necessary (under this process) to cut it from a blank much longer than the length of the sheet desired (see Exhibits 16 and 17)."

Thus complainants argue that because there is a shortening of the sheet, there is a loss in material, or conversely a gain by preventing shortening. The argument is plausible to the unfamiliar mind, but in fact we cannot get something from nothing and we have explained above the actual effect of the shortening. With absolute truth it might be said that the Golding-Durkee type would make wide meshes with thin sheets, whereas with the later machines the size of sheet is limited to the amount of stretching which the metal will stand. Therefore, it might be said with partial truth and more plausibility, that the Golding & Durkee machine is a better one because it could open metal with greater expansion. But this would be mere sophistry. The plain truth is that when we come to cut heavy sheets, considerable stretching is inseparable from the act of cutting, and the patentee availed himself of this characteristic by adapting his knives to stretch uniformly on both sides and arranging them in a machine organized to cut according to the well known process in the necessary alternate places.

Complainant's brief also states:

> "SECOND. Because of the shearing cut, the thickness of the metal is limited; it is impractical to cut metal more than $\frac{1}{15}$ of an inch thick in this way (Golding, Q. 13)."

This statement is misleading. In no case can the shearing of the sheet begin until the metal has been stretched. This is so, whether the metal is thick or thin; but thick sheets will stand greater stretching than thin sheets and therefore in treating thick sheets it is possible to use knives which stretch to a large extent, and when using thin sheets it is necessary to select knives constructed and organized to stretch to a small extent only. There is no mystery about this—it is a simple matter of adapting the knives to the kind of material which the machine is intended to treat.

Complainant's brief also states, on page 21:

> "THIRD. The strands of the meshes do not lie in straight lines. This results from the stepped method of cutting the sheet on lines diagonal to its length, and may be observed in any of the samples of the metal produced by this method (Complainant's Exhibits Nos. 11, 13, 14, 15, 16 and 17). It is, perhaps, more clearly shown in the partially cut samples B, C (Exhibits 14 and 15). * * *

We have already briefly referred to the comparative irregularity of the product of the machine of the Golding & Durkee "second process" and the machine of the patent in suit. The fact is simply that the machine suggested in the patent in suit is a simpler, stronger and better machine, which, because it has stationary bed knives and vertically reciprocating moving knives arranged in a single line, keeps the metal under control; is itself easy to keep in repair and therefore will continue to make more a regular and better product than the machine of the so-called "second process", in which the stepped upper knives and the shifting lower knives are more difficult to keep in repair, and when out of repair, produce a less uniform product. But this is simply the difference which exists in every case where an improved machine is invented. The merit of a new machine may be more rapid work, but very frequently the merit is that it does better work and produces a more uniform product. This is so in the case of the machines now under consideration; and it is idle, as we have suggested elsewhere, to argue from the better work of the machine that it embodies a new or patentable process. The facts regarding the machine are fully set forth in the testimony of defendant's witness, Kennedy, on pages 198–204, and the testimony of White, pages

229, 230 and pages 211, 212. Mr. White, on page 212, shows that the samples put in evidence by the complainant were made with dull and defective knives, and he says, on page 211:

> "The form of the mesh is determined by the design of the dies. By this I mean the shape of the upper and lower cutters which in co-operating act on the metal sheets. The shape of the mesh may be modified by the stroke of the machines, or by the distance to which the cutters penetrate the sheet. This being the case, one machine, as for instance that shown in patent No. 381,230, by a simple modification of the cutters or a variation in the stroke of the machine, could be made to produce a variety of forms of mesh. The form of the mesh is not a question of the process employed, but is a question of the form of the dies used for cutting and expanding, since it is evident that the regularity of the mesh formed will be dependent upon the cutters and the length of the stroke rather than upon the process or principle of operation employed. The rigidity of the machines will also play a prominent part in the regularity of the mesh, since, if the machine be so light as to spring materially, the meshes will obviously be irregular. The condition of the cutters as regards their sharpness is also a consideration, as a dull cutter, which will tear the metal, will manifestly more or less distort the metal."

The complainant's brief also states (p. 32):

> "FOURTH: The strands are not of uniform width throughout. Owing to the shearing cut, and the fact that the outer ends of the strands are free, *i. e.*, severed from the body of the sheet, the strands are somewhat wider at one end than at the other. This may be observed in any of the samples of metal made by the old process. This irregularity in the width of the strands not only makes the sheet unsightly and unsuitable for exposed screens, etc., but weakens the sheet as a tension member for reinforced concrete constructions, where uniform strength is required throughout, since the strands have only the strength of their smallest section."

This is simply another way of saying what is said in the third paragraph. And the fifth paragraph is but further iteration of the same thing:

> "FIFTH. The strands are more or less wavy and crooked. This also results from the fact that the outer ends of the strands are free or severed from the body of the sheet while they are being bent, because, for this reason, they are not subjected to sufficient tension to straighten them."

Complainant's brief also states:

> "SIXTH. The sheets are not square or rectangular. To obtain a rectangular sheet it is necessary to cut off triangular pieces at each end. Not only is this a waste of expanded metal, but the boundaries are not then at right angles to the meshes and the sheet is unsightly when fitted to metal frames."

The claim of excess of waste is a contradiction of the Golding & Durkee Patent, No. 320,241, which states as one of its meritorious features that—

> "The entire piece of metal is consumed and no part or portion is wasted."

Complainant's witness Curtis admits on cross-examination that the amount of metal which must be sheared off as waste from the product of the machine of the patent in suit is greater than the waste from the product of the prior machines of the Golding and Durkee Patent, and this statement of complainant's brief is therefore in direct contradiction of the evidence (Curtis, p. 92, x-Q. 83).

The errors in complainant's brief which we have noted above are illustrative. The real fact shown by defendant's witness Kennedy is that the machine of the patent in suit is desirable only because it is a good machine, with simpler, stronger and better knives, capable of doing harder work and easier to keep in repair. Its superiority is not due to any novel process.

Summary of Facts.

Before discussing the law of the case we venture to restate briefly the history of the machine of the patent in suit.

We have already shown that no new relation or sequence of steps is disclosed by the patent in suit; that in the prior manufacture of expanded metal the strands were formed by splitting and opening the sheet in alternate places and repeating these acts until the sheet is finished.

The "manner" of doing this which is above referred to was the "manner" of the machine and nothing else as will appear even more clearly as we review the circumstances that led up to the adoption of the Golding-Durkee machine of the "second process."

We have shown that when Golding and Durkee designed their machines they designed them to open out thin sheets in the treatment of which it was desirable to avoid the stretching, because the thin sheets could not be stretched out into the wide meshes that they aimed to make. There was at that particular time no demand for thick sheets, but when trade requirements called for thick sheets Golding organized machines with cutting mechanism adapted to cut thick sheets and in their organization discarded the now unnecessary means to avoid the stretching. No new combination was needed and none was devised or discovered. It was only necessary to omit the special appliances which were used in the prior machines to lessen the stretching. Golding says on page 158, Q. 171:

> "Expanded metal was not made commercially until after the invention of the Golding & Durkee process and machine No. 320,242 and 381,231. At that time the use of expanded metal as a concrete reinforcement was unknown, and the manufacturers licensed under the patents last named undertook to dispose of the products of the machines for fencing and other like purposes, but with very indifferent results, but I found that I could make *lathing* upon these machines by simply lessening the stroke of the upper blade, and after the machines had been so adjusted they were run *almost continuously on lathing.*"

We have already shown that the very act of slitting metal when the ends of the slitted strips are not severed causes the metal to

stretch or elongate. In thin sheets this distension is relatively slight. When however the sheets are of a thickness of say three-sixteenths of an inch or thicker, the stretching due to the act of slitting as the cutting die presses the metal before it, becomes a factor which must be taken into account in the construction of the machine. In the opening of thick sheets it is essential therefore for the manufacturer to *avail himself of the ability of the metal to stretch* or elongate. Whether or not the stretching shall be the maximum of the capacity of the metal to stretch depends upon the shape and movement of the cutting dies. It is obvious that the further the cutter moves downward the greater will be the amount of stretching, and that if the cutter stops its downward course after effecting the slit the stretching will then cease. We shall presently see the importance of knowing this.

For years, or from 1885 up to the time of this suit, the patentee and his licensees were engaged in expanding thin sheets by the method of slitting and opening in alternate places with the stepped cutters of the Golding-Durkee Patents. In the operation of the machines he then used he sought, as we have seen, to limit the stretching for the reason that he could not depend on the thin sheets to stand the strain. To avoid the stretching he arranged the cutting dies of the machine in a stepped row, and by reason of this stepped arrangement the under reciprocating dies were permitted to have a side movement. When the two dies effected the slit the straight downward movement of each upper cutter caused the under cutter to move out of the way, thus permitting the metal strip that was severed by the cut to swing down into the space occupied by the lower cutter during the act of cutting. Speaking of this arrangement of the cutters Golding, in the Bradford suit, in answer to question 7 of page 20, says:

> "The receding action of the lower knife and the following of the upper knife permits the metal to contract in the direction of the receding lower knife, that is, to the left, as shown in the model, and this receding or shortening, as explained, in our 2½ inch mesh is about one inch, as the measure around the mesh and directly across the diamond longitudinally, will show."

Devised as they were to avoid the stretching, the earlier machines were well adapted for the purpose for which they were made,

i. e., the opening of thin sheets in wide meshes, and the fact that they were still in use at the time of the beginning of this suit, is evidence that they were successful for the purpose for which they were built. Their product had a large use as lathing in fireproof buildings, which was the first practical use to which expanded metal was put.

The practice of constructing fireproof buildings led also to the adoption later of the use of concrete, among other things, for making floors. It was found that expanded metal, if made of plates instead of thin sheets, could be adapted to the use of reinforcing concrete in competition with other metallic shapes. Golding says on page 159, Q. 171:

> "It was not until about 1891 that *I found use* for expanded metal for concrete reinforcement. For this use a considerable quantity was sold and has continued to be sold until recently for a short span light concrete work, or for bonding concrete in long spans where the concrete was further reinforced by round steel rods, *it not being possible by the machinery built* to carry out the process of patent 320,242 to make expanded metal of sufficient strength to carry long span concrete work. We never could use steel plates of above a sixteenth of an inch in thickness. * * *" (Italics ours).

The machines which were then built not being suitable to treat the heavy metal, Golding set about to get the necessary machines. The problem before him was the building of machines to change the form of plates by cutting and opening in alternate places. His aim was to transform the thick sheet from a flat blank into a screen-like structure, just as he had for years been doing before by slitting and spreading apart the thin sheets in alternate plates. Any machine which would perform that old function, would produce expanded metal, regardless of whether the metal was stretched much or little during the operation, and as he knew that the thick metal which he purposed to use made it unnecessary to avoid the stretching, the stepped row of cutters would not be necessary. He accordingly threw aside that stepped arrangement of the cutters, with the laterally moving under cutters by which he had sought to minimize the stretching of the metal in the thin sheets and fixed his cutters in a straight row. The effect of the

straight cutters was to retain the metal rigidly in their grip and by the sheer power of mechanism force the cut portions to take the desired shape. In other words, in their operation there was no attempt made to free the metal as in the prior machine, so that it would bend without the straining which it was necessary to avoid in opening wide meshes in thin sheets.

Stretching is present to some extent in the operation of all the machines. The extent is a question of degree depending upon the shape and relative movement of the cutting knives.

Therefore the Golding-Durkee machines and the machines of the patent in suit perform the same steps of slitting and opening the metal in alternate places. One was equipped with knives to minimize stretching and was designed to open wide meshes in thin sheets. In the design of the second machine adapted to cut thick sheets no effort is made to lessen the stretching and the shape of the mesh is made to conform to such stretching as the metal will stand.

The earlier machine effected the alternate position of the cuts by presenting the sheet to an oblique series of cutters with a corresponding oblique feed. The later machine effected it by shifting the sheet between strokes. These are simply characteristics of the machines.

Nothing in the nature of a new method is involved in the case.

Construction of the Claim.

To our apprehension, the single claim of the patent in suit is not open to doubt or uncertainty as respects its proper construction. It is clear and specific in its terms, free from ambiguity, and is to be fairly construed accordingly.

But, at the different hearings heretofore had, there has been a lack of uniformity as respects the construction which complainant asked that the claim should receive. In the Court of Appeals in the Third Circuit (Bradford Case) chief stress was laid by complainant upon the element of *stretching the strands simultaneously with the cutting and bending.* This was shown to be old, and old in the same art as by the Ohl patent, and that Court decreed accordingly. It was also admitted to be old in the proceeding in the Patent Office and by counsel on their motion for rehearing in the Bradford case, as we have already shown.

At the later hearing in the Court of Appeals for the Sixth Circuit, in the construction asked for, another element was sought to be included—viz., *the edgewise action of the cutters, continuous along the uncut edge of the sheet at every stroke and the successive repeating of the operations of slitting and stretching back of the portions previously acted upon.*

Presumably this new interpretation which complainant asks to be given to the claim is necessary to the complainant's argument; but it is as untenable as the interpretation previously advanced by complainant in the Bradford case, for the following reasons:

1. The claim says nothing about any such continuous edge-cutting, nor is anything of the kind necessarily or fairly implied.

The patentee must stand or fall by his claim as he made it.

Railroad Co. vs. Mellon, 104 U. S., 112.
Keystone Bridge Co. vs. Phœnix Co., 95 U. S., 274.
Water Meter Co. vs. Desper, 101 U. S., 332.

Nor does it make any difference that the Patent Office Examiner suggested the claim. If the claim so suggested did not adequately define his invention, the inventor was not bound to adopt it. By adopting it, he made it his own and is bound by it.

2. But this construction of the claim, by including the continuous edgewise action of the cutters, is untenable for the reason that such action is only stated in the specification as the one which "I prefer" (R., p. 409, lines 34–36).

3. It is also untenable because the manufacture of expanded metal by the formation of rows of slits alternating with one another in parallel lines was old, as shown in the opinion of the Court of Appeals of the Eighth Circuit given by Judge SANBORN, and already quoted from 111 Fed. Rep., 395. These operations are essential to the manufacture of expanded metal and characterize all the prior patents. Indeed, the simultaneous opening and slitting and the repetition of these simultaneous actions, over and over again, each series of slits being back of the preceding ones, until the entire sheet is expanded, is a characteristic feature of Golding & Durkee's "second process," embodied in their patent No. 320,241.

The Alleged Invention of the Patent in Suit is not Patentable as a Method.

The subject-matter of the claim being a *Method*, the patentee must be an original and first inventor of a *method*.

Method patents have to do only with operations or ways of doing things. Accordingly, a method, as that term is used in the patent law, is a mental conception which must be new and original with the patentee.

Thus in *Tilghman vs. Proctor*, 102 U. S., 707, 728, Mr. Justice BRADLEY, in distinguishing a process from a machine, says:

> "A machine is a thing. A process is an act or a mode of acting. The one is visible to the eye—an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed."

Possibly this is somewhat metaphysical, but if so, it inheres in the subject. Some ninety years ago Mr. Justice STORY, in disposing of a patent case then pending before him, said:

> The doctrine of patents may truly be said to constitute the metaphysics of the law.
>
> *Barrett vs. Hall*, 1 Mason, 447, 472.

Keeping in mind the distinction, both in fact and in law, between method and apparatus, we have in our reports of adjudicated 'Method" cases, three classes of decisions.

1. Those in which the patentee is shown to be the first and original inventor of the *entire* method, as in:

O'Reilly vs. Morse, 15 How., 62.
Eames vs. Andrews, 122 U. S., 40 (the Driven Well case).
The Telephone Cases, 126 U. S., 1.

2. Those in which the patentee is the inventor of some *new* and *essential part* of a method otherwise old, as in:

Mowry vs. Whitney, 14 Wall., 630.
Cochrane vs. Deener, 94 U. S., 780.
New Process Fermentation Co. vs. Maus, 122 U. S., 413.

In cases coming fairly in either of these two classes, the patents have generally been sustained—and properly so.

3. In the third class are included those patents which include *no substantial novelty of operation*, or those in which *every essential element of method* is already well known in the same art.

In such cases, the Courts have uniformly held a method claim to be void—and this for the reason that in respect of method, the patentee has invented nothing. In fact, nothing remains for him to invent except a machine by which to work the method.

Very briefly, our position is this:

That in a method claim, in order that it may be held patentable, the patentee must have incorporated some novelty of operation which was previously unknown in the art to which his invention belongs, and this must be something different from the mere mode of operation of apparatus with which an old method is put into practice.

It is believed that the decisions of the Courts fully sustain this rule, and that it is well founded both in fact and in law.

The earliest case in this Court bearing directly on this question is *Corning vs. Burden*, 15 How., 252. Previous to the date of Burden's invention, "puddle balls" of intensely hot mushy iron, the crude product of the puddling furnace, had been placed on an anvil and pounded with a steam hammer, or squeezed between rolls or between the jaws of alligator squeezers, so as to press out the objectionable fluid cinder held in the ball much as a sponge holds water. The ball was given a quarter turn after each squeezing operation and the fluid cinder was gotten rid of by compression.

Burden's improvement seemed to be a radical change. His patent was entitled and his specification described "a new and useful machine for rolling puddle balls and other masses of iron in the manufacture of iron"; but the claim was for "the preparing of the puddle balls * * * by causing them to pass between a *revolving cylinder* and a *curved segmental trough* adapted thereto, constructed and operating substantially in the manner of that herein described and represented." This Court held in substance and effect that this improvement did not constitute a new process. And obviously the decision was correct. The *operation performed*, or *the thing to be done*, was the same as in the prior art—the forcible exudation or expressing of the fluid oxide *by compression* while the puddle ball was intensely hot. Though Burden's apparatus was

radically different in structure, and *rotated* the ball between converging surfaces, and though his claim as for a machine was doubtless valid, still in respect of the process or operation involved, he had done nothing which was patentably new.

The decision of this Court in Corning vs. Burden was cited with approval in the later case of *Risdon Iron & Locomotive Works vs. Medart*, 158 U. S., 68, in which this Court said:

> "The leading case in this Court is that of *Corning vs. Burden* (56 U. S., 15 How., 252), decided at the same term with that of *O'Reilly vs. Morse, supra*. The patent was for a new and useful machine for rolling puddler's balls and other masses of iron, in the manufacture of iron. Upon the trial the Court below charged the jury that the patent was for a new process, mode or method for converting puddler's balls into blooms by continuous pressure and rotation of the balls between converging surfaces. Upon appeal to this Court, however, the patent was held to be one for a machine, and in delivering the opinion of the Court, Mr. Justice GRIER stated with great clearness the difference between such processes as were patentable and such as involved merely mechanical operation.
>
> "A process *eo nomine* is not made the subject of a patent in our Act of Congress. It is included under the general term 'useful art.' An art may require one or more processes or machines in order to produce a certain result or manufacture. The term 'machine' includes every mechanical device or combination of mechanical powers and devices to perform some function and produce a certain effect or result. But where the result or effect is produced by chemical action, by the operation or application of some element or power of nature, or of one substance to another, such modes, methods or operations are called processes. * * * It is when the term process is used to represent the means or method of producing a result that it is patentable, and it will include all methods or means *which are not effected by mechanism or mechanical combinations*. But the term process is often used in a more vague sense, in which it cannot be the subject of a patent. Thus we say that a board is undergoing the process of being planed, grain of being ground,

iron of being hammered or rolled. Here the term is used subjectively or passively as applied to the machinery operated on, and not to the method or mode of producing that operation, which is by mechanical means, and the use of a machine, as distinguished from a process. *In this use of the term it represents the function of a machine, or the effect produced by it on the materials subjected to the action of the machine. But it is well settled that a man cannot have a patent for the function or abstract effect of the machine; but only for the machine which produces it.*" (Italics ours.)

The cases of *Burr vs. Duryee*, 68 U. S., 570, and *Fuller vs. Yentzer*, 94 U. S., 288, state the rule of law applicable to the case at bar. In quoting these cases in the later case of *Westinghouse vs. Boyden Power Brake Co.*, 170 U. S., 553, this Court said:

"In the subsequent case of *Burr vs. Duryee*, 68 U. S. 1 Wall., 531, 570, Mr. Justice GRIER laid down the same principle as follows:

"'The patent act grants a monopoly "to anyone who may have discovered or invented any new and useful art, machine, manufacture, or composition of matter." * * * The law requires that the specification "should set forth the principle and the several modes in which he has contemplated the application of that principle or character by which it may be distinguished from other inventions, and shall particularly point out the part, improvement, or combination which he claims as his own invention or discovery." We find here no authority to grant a patent for a "principle" or a "mode of operation," or an *idea*, or any other abstraction. A machine is a concrete thing, consisting of parts, or of certain devices and combination of devices. The principle of a machine is properly defined to be "its mode of operation," or that peculiar combination of devices which distinguish it from other machines. A machine is not a principle or an idea. The use of ill-defined abstract phraseology is the frequent source of error. It requires no great ingenuity to mystify a subject by the use of abstract terms of indefininite or equivocal meaning. Because the law requires a patentee to explain the mode of operation of his peculiar

machine, which distinguishes it from others, it does not authorize a patent for a "mode of operation as exhibited in a machine." Much less can any inference be drawn from the statute, that an inventor who has made an improvement in a machine, and thus effects the desired result in a better or cheaper manner than before, can include all previous inventions, and have a claim to the whole art, discovery or machine which he has improved. All others have an equal right to make improved machines, provided they do not embody the same, or substantially the same, devices or combination of devices, which constitute the peculiar characteristic of the previous invention.'

So, also, in *Fuller vs. Yentzer*, 94 U. S., 288, this Court, speaking through Mr. Justice CLIFFORD, also said:

'Patents for a machine will not be sustained if the claim is for a result, the established rule being that the invention, if any, within the meaning of the Patent Act, consists in the means or apparatus by which the result is obtained, and not merely in the mode of operation, independent of the mechanical devices employed; nor will a patent be held valid for a principle or for an idea, or any other mere abstraction.'"

In *Knapp vs. Morss* (150 U. S., 227), this Court, by Mr. Justice JACKSON, said:

"It is well settled by the authorities that the end or purpose sought to be accomplished by the device is not the subject of a patent. The invention covered thereby must consist of a new and useful means of obtaining that end. In other words, the subject of a patent is the device or mechanical means by which the desired result is to be secured."

In *Westinghouse vs. Boyden Co.*, the Supreme Court further said:

"At the same time, as hereinafter observed, this liberality must be exercised in subordination to the general principle above stated; that *the function of a machine cannot be patented*, and hence that the fact that the defendant's machine performs the same function is not conclusive that it is an infringement." * * * "But after all, even if the pat-

ent for a machine be a pioneer, the alleged infringer must have done something more than reach the same result. He must have reached it by substantially the same or similar means, or the rule that the function of a machine cannot be patented is of no practical value. To say that the patentee of a pioneer invention for a new mechanism is entitled to every mechanical device which produces the same result, is to hold, in other language, that he is entitled to patent his function."

In *Wing vs. Anthony*, 106 U. S., 142, 146, the Court said:

"He (the patentee) did not discover the law that to get the best effect in taking pictures the plate, or part of the plate, on which the picture is to be taken, should be brought into the field of the lens, nor did he invent the method of doing this by tilting the camera itself into different positions with respect to the object to the picture. This law was known and the practice mentioned was followed, long before Southworth's invention. His device was simply a new and specific means to take advantage of the well known law of nature."

It is submitted that these authorities apply with controlling force to the case at bar.

Further decisions of this Court with regard to method claims under which effort was made to monopolize old and known ways of doing things are:

Brown vs. Piper, 91 U. S., 37.
Miller vs. Force, 116 U. S., 22, 27.
Dreyfus vs. Searle, 124 U. S., 60.
Crescent Brewing Co. vs. Gottfried, 128 U. S., 158.
Ansonia Brass Co. vs. Electric Supply Co., 144 U. S., 11.
Lovell Mfg. Co. vs. Cary, 147 U. S., 623.

The decision of this Court in Risdon Locomotive Works vs. Medart, 158 U. S., 68, is also controlling of the case at bar.

It seems to be fairly inferable from what the petition for writ of *certiorari* and the brief filed therewith by the complainant in this Court in the Bradford case, that in the view of complainant's counsel the decision in Risdon Locomotive Works vs. Medart, if it did

not work some change in the law as understood up to that time, at least *unsettled* the law, to the detriment of method claims, and that it should be qualified or restated; but as we understand that decision we fail to see that it stated any rule which is not precisely at one with all the prior decisions of this Court.

The claims of the patent in suit in the Risdon-Medart case purported to cover an improved process of making belt pulleys by subjecting the material to certain operations in a specified order, namely, centering, grinding, boring, etc. The Court held the patent to be invalid because it did not disclose a patentable method, and reviewed the authorities. The Court said:

> "The four claims of the patent make no reference to the mechanism exhibited in the drawings, and described in the specification. All claim an improvement in the art of manufacturing, and set forth in more or less detail the various steps in that process. That certain processes of manufacture are patentable is as clear as that certain others are not, but nowhere is the distinction between them accurately defined. There is somewhat of the same obscurity in the line of demarkation as in that between mechanical skill and invention, or in that between a new article of manufacture, which is universally held to be patentable, and the function of a machine, which it is equally clear is not. It may be said in general that processes of manufacture which involve chemical or other similar elemental action are patentable, though mechanism may be necessary in the application or carrying out of such process, while those which consist solely in the operation of a machine are not. Most processes which have been held to be patentable require the aid of mechanism in their practical application, but where such mechanism is subsidiary to the chemical action, the fact that the patentee may be entitled to a patent upon his mechanism does not impair his right to a patent for his process; since he would lose the benefit of his real discovery, which might be applied in a dozen different ways, if he were not entitled to such patent. But, if the operation of his device be purely mechanical, no such considerations apply, since the function of the machine is entirely independent of any chemical or other similar action.
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> * * * * * * *

> Although the cases are not numerous, this distinction between a process and a function has never been departed from by this court, and has been accepted and applied in a large number of cases in the circuit courts. The following processes have been held not to be patentable: An improvement in sewing machines, by which the soles and uppers of boots and shoes could be sewed together without any welt by a certain kind of stitches. *McKay v. Jackman*, 12 Fed. Rep., 615. A process for washing shavings in breweries, *Brainard v. Cramme*, 12 Fed. Rep., 611. For an improved method of treating seed by steam, *Gage v. Kellogg*, 23 Fed. Rep., 801. A process for crimping heels stiffenings of boots and shoes, *Hatch v. Moffit*, 15 Fed. Rep., 253. See also *Sickels v. Falls Co.*, 4 Blatchf., 508; *Excelsior Needle Co v. Union Needle Co.*, 32 Fed. Rep., 221.
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> * * * * * * *
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> Medart may or may not have been entitled to a patent for the machinery employed in the manufacture of the belt pulleys in question; but he certainly was not entitled to a patent for the function of such machines, nor to the completed pulley, which differed from the prior ones only in its superior workmanship."

Immediately following, the learned Justice collates and cites with approval the leading English and American adjudications in which method or process claims had been sustained—and then adds (p. 77):

> "It will be observed that, in all these cases, the process was either a chemical one, or consisted in the use of one of the agencies of nature for a particular purpose."

In every "method" or "process" case which has received the favorable action of the Supreme Court, the claim in question has called for or contained some "elemental action," chemical or otherwise, or patentable novelty has been found "in the use of one of the agencies of nature," and the "action" or "agency" was then new in the particular art to which the invention in question belonged.

Thus in *Cochrane vs. Deener*, 94 U. S., 780, "the agency of nature" there first introduced into the flour-making art was the force of a blast of air, made operative at a particular stage of the

operation. In *Tilghman vs. Proctor*, 102 U. S., 707, it was heat and pressure. In *New Process Co. vs. Maus*, 122 U. S., 413, it was gas pressure applied to the manufacture of beer. In *Carnegie Steel Co. vs. Cambria Iron Co.*, 185 U. S., 403, it was the mixing and diffusion of bodies of molten pig iron unequal in temperature and composition. In the *Telephone Cases*, 126 U. S., 1, it was electrical waves of undulatory character, convertible into sound waves at the receiving end of a circuit.

While, as we thus understand, *Risdon vs. Medart* worked no change in the law as to what might be patented as "method" or "process", it, on the other hand appears strongly to reaffirm and emphasize *the rule of exclusion* as to what could *not* be so patented.

The present case is believed clearly to come within this rule of exclusion; for it contains nothing not previously known in respect of the use of the agencies of nature. As has already appeared, these were all old. *As to them*, Golding invented nothing.

To this extent and for this purpose, *Risdon vs. Medart* is believed to be a controlling authority herein.

In the case of *Westinghouse vs. Boyden*, 170 U. S., 537, the rule of *Risdon vs. Medart* is reaffirmed (p. 556); *Wicke vs. Ostrum*, 103 U. S., 461, is cited with approval (p. 557); and then the opinion proceeds as follows (p. 557):

> "These cases assume, although they do not expressly decide, that a process to be patentable must involve a chemical or other similar elemental action, and it may be still regarded as an open question whether the patentability of processes extends beyond this class of inventions. Where the process is simply the function or operative effect of a machine, the above cases are conclusive against its patentability; but where it is one which, though ordinarily and most successfully performed by machinery, may also be performed by simple manipulation, such, for instance, as the folding of paper in a peculiar way for the manufacture of paper bags, or a new method of weaving a hammock, there are cases to the effect that such a process is patentable, though none of the powers of nature be invoked to aid in producing the result (*Eastern Paper Bag Co. v. Standard Paper Bag Co.*, 30 Fed. Rep., 63; *Union Paper Bag Machine Co. v. Waterbury*, 39 Fed. Rep., 389; *Travers v. Am. Cordage Co.*, 64 Fed. Rep., 771). This case, however, does not call for an expression of our opinion upon this point."

The concluding sentence of this extract seems to indicate that the learned Justice who wrote it, regarded it as an *obiter dictum*; and while it is not for us to say what was in the mind of the Court, this extract reads much as if this Court was not prepared to give its assent to the validity of patents which depend upon the performance of mechanical operations such as the weaving of hammocks and the making of paper bags.

If such mechanical processes are unpatentable, it of course would follow that the patent in suit is invalid, for it includes nothing but mechanical operations; *but that question is not necessarily involved in the case at bar.* If the decisions of the Circuit Courts sustaining patents for modes of making paper bags and modes of weaving hammocks were correct in principle, they were correct only because the patentee had invented some *new manner* of folding or some *new manner or intricacy* of weaving by which a new kind of bag or new kind of fabric was produced, and reference to the cases above cited in the decision of the Supreme Court (30 Fed. Rep., 63; 39 Fed. Rep., 389; 64 Fed. Rep., 771) will show that such was the case in each instance. By virtue of the same principle, Long's discovery, in 1862, that expanded metal—a new product—could be made by alternate slitting of a sheet and opening the slitted strands, may have been patentable as a new method, *i. e.*, a new series of acts which produced a new thing. But when this supposedly valid method of making paper bags or weaving hammock fabrics had been invented, and the patentee proceeded to invent a machine or machines for putting it into commercial practice, he would not be entitled to obtain a new patent for a second method, simply by virtue of the fact that in practicing the old method the machine exhibited its own peculiar mode of operation and perhaps *stretched* the bag or *stretched* the cords of the hammock in the course of its manufacture. The case at bar is precisely as above stated. The only possible method in this art in a patentable sense—if mechanical methods are patentable at all—was Long's original discovery of the manufacture of expanded metal in 1862. As we have elsewhere contended, all subsequent improvements in this art were improvements in means for carrying Long's original method into effect, and if new, they were patentable as means and not patentable as methods, although they acted according to distinctive modes of operation. If the rule were otherwise it would follow, not only in this art of making expanded metal, but in the other arts of metal working, that

there could be as many patents for processes as for machines. Each machine patent would have its double in a process patent. Nothing more clearly than this can illustrate the fundamental principle of justice which underlies the decision of this Court in *Risdon vs. Medart.* The progress of the useful arts is promoted by the grant of patents for new and useful machines. The useful arts would be correspondingly hampered by the grant of patents for functions or modes or laws of operation of machines for practicing old methods of manufacture; for such patents by monopolizing the function would at once discourage the invention of all other means for performing the same function with cheaper or otherwise better results.

Golding's machine may be new and useful. His patent therefor (Rec., p. 424) gives him full protection; and defendant is not charged with any infringement thereof. But the method employed in the working of that machine (or of so much of it as is disclosed in the patent in suit) was not of his invention, and hence he can take nothing by his method patent.

In these respects the case at bar resembles the case of *Busch vs. Jones*, 184 U. S., 589, in which case—the latest utterance of this Court on the present subject—the Court held the following claim to be invalid:

> "The process herein described for treating folded printed sheets of paper in dry-pressing, the same consisting of subjecting a collection of such sheets to pressure without the use of fuller-boards, and while under such pressure tying them into compact bundles with end boards, then removing them immediately from the press, and allowing them to remain tied sufficiently long to fix and complete dry-pressing."

The Court said, by Mr. Justice McKenna:

> "What, indeed is the process? What is the force at work? And the inquiry is entirely independent of questions as to what constitutes a patentable process discussed by this Court in Risdon Locomotive Works vs. Medart, 158 U. S., 68; and in Westinghouse vs. Boyden Power Brake Co., 170 U. S., 537. What, then, is the force at work and how is it applied? It is force (pressure) applied to sheets of paper placed between 'compressing-heads.' In other words, a special ap-

plication of pressure began in the press and continued in the bundle by means of strings and cords. This, however, is the operation and effect of the machine, and it is none the less so because the pressure is held indefinitely. Its existence in the bundle is not independent of the press. The pressure is as much an effect in the bundle as when first applied. The pressure is applied by the press, and so, substantially, are the bands or cords which continue the pressure, and we cannot assent to the view that the continuation of the pressure in the bundles with the consequence of removing type indentations in the printed sheets is anything but the natural and direct effect of the machine."

Tho following are some of the decisions of the Circuit Court:

In *MacKay vs. Jackman*, 12 F. R., 615, which involved a patent for an alleged process of making shoes, Judge WHEELER said:

"A mere process for making an article is not of itself a patentable invention."

Continuing Judge WHEELER said, on page 618:

"This was all due to the machine and its operation, and when he had patented the machine he had patented all there was of it."

In *Brainard vs. Cramme*, 12 F. R., 621, Judge WALLACE held a process for washing shavings in breweries to be invalid, on the ground that it was nothing more than the employment of the described apparatus.

In *Hatch vs. Moffit*, 15 F. R., 253, the claim was for a process for crimping heel stiffenings of boots and shoes. This was declared invalid as being merely for a mode of operation.

In *Excelsior Needle Co. vs. Union Needle Co.*, 32 F. R., 221, the patentee of a machine for producing needles of a superior quality subsequently obtained a patent upon the product of such machine. This later patent was held by the Court to be an attempt to patent a function of a machine, and to be invalid for that reason.

In *Wells Glass Co. vs. Henderson*, 67 F. R., 930, the patent was for a process of manufacturing metallic cross-bars and rails for window sashes and analogous structures, and was held invalid as covering a purely mechanical process.

In *International Tooth-Crown Co. vs. Bennett*, 72 F. R., 169, a claim for a method of fixing artificirl teeth in the mouth was declared invalid.

In *Strom Mfg. Co. vs. Weir Frog Co.*, 75 F. R., 279; affirmed by this Court, 83 F. R., 170, the method claim involved was like that of the patent in suit in that it related to mechanical steps of treating a metal blank, and was as follows:

> "The improvement in the art of manufacturing rail braces, consisting in striking up a metal blank into a hollow abutment rising from a base, with its front or abutting end and said base shaped to the portions of the rail against which the base is to bear, substantially as described."

The Court directed the dismissal of the bill upon demurrer.

In *Travers vs. Hammock and Fly-Net Co.*, 78 F. R., 638, Judge SEAMAN said:

> "This patent contains two claims of similar nature, and each stated as for 'the art of making hammocks.' I think each clearly states a process under the definitions of the patent law; that it involves merely mechanical operations without any chemical action or the operation of natural elements; and that, therefore, the process is not patentable."

In *Gindorff vs. Deering*, 81 F. R., 952, the method claims recited a series of mechanical steps. One of the claims read:

> "(4) The method of serrating sickle sections, which consists in maintaining the sections in position side by side, serrating the outer edges by machine-actuated serrating tools, transposing the sections, and then serrating in a similar manner the outer edges of the transposed sections, substantially as described."

Judge GROSSCUP said:

> "The two last-mentioned claims are process claims. It is my opinion that under the case of *Locomotive Works vs. Medart*, 158 U. S., 68, these claims cannot be sustained. Except for the described functions of the machine, there is

> nothing more stated in the patent than the fact of a manual transportation of the sickles after their outer edges have been serrated, so that the inner edges may undergo a like operation. Such transportations, superadded to the functions of the machine, do not make the treatment a method, or process or art, such as the patent law contemplates."

In *Rynear Co. vs. Evans*, 83 F. R., 696, where the process of swaging up metal blanks into articles of manufacture was applied to the making of artificial tooth crowns or caps, Judge COXE declared the patent invalid for the same reason.

In *American Strawboard Co. vs. Elkhart Egg Case Co.*, 84 F. R., 960, wherein a method of forming egg cases from straw-board was involved, Judge BAKER declared the claim invalid.

In Stokes Bros. Co. vs. Heller, 96 F. R., 104, the Stokes patent No. 408,936, for a process or method of forming teeth on a rasp blank, was held to be void as covering the mere mechanical operations or functions of the machine.

In *Dodge Manufacturing Co. vs. Ohio Pulley Works*, 101 F. R., 586, the method claim there under consideration, which involved the step of glueing, was declared invalid. Judge LURTON said on page 586:

> "Neither am I satisfied that the process involves anything more than the operation of mechanism. The suggestion that the application of liquid glue involves chemical action is not evident. It seems to me that under the principles of Locomotive Works vs. Medart, 158 U. S., 68, and the cases there cited, if the method was new or the result new, the process is not the subject of a patent."

In *Dodge Mfg. Co. vs. Collins*, 106 F. R., 35, and *Ballou vs. Potter*, 88 F. R., 786, this rule was again applied.

In view of the law as thus appearing, it is submitted that the Golding method claim in suit is void, for every operative feature of it was already a known part of the same art—so that in respect of the method, there was nothing left for him to invent.

If the claim is taken as it reads, and following the reasoning of *Burr vs. Duryea*:

1. Golding was not the first to make expanded metal by edgewise cutting a sheet with use of alternating cuts and opening the sheet by pulling out the strands thus cut.

Long's British specification of 1862 (Rec., p. 261).

Johnson's British specification of 1885 (Rec., p. 265).

And Golding had shown it in his own U. S. patents of 1884 and 1885.

Nor can complainant be heard to say that these patents contributed nothing to the art, in view of their large commercial use.

2. Nor was Golding the first to make "open or reticulated metal work," as appears by the same citations, and also by his earlier patents.

3. Nor was he the first—

> "in simultaneously slitting and bending portions of a plate or sheet of metal in such manner as to stretch, or elongate the bars connecting the slit portions and body of the sheet or plate,"

for this is exactly what Ohl had done and had patented in 1892, two years or more earlier. And furthermore Ohl did the work by the same kind of a cutter as Golding now uses, with, however, the same difference as was held to be immaterial in *Corning vs. Burden*—in the one case (Ohl) the operative motion was rotary (as in Burden), while Golding's motion is reciprocatory (as was the older art in Burden's case).

4. Neither was Golding the first in alternating the action of his cutters, or in repeating the operations at stroke after stroke of the machine, for such alternation and repetition appear in the prior patents above cited.

The remainder of the claim is merely descriptive of the result and adds nothing to the supposed novelty of the operation already set forth. As a description of a result, it is nugatory, for a result is not an "Art", a "Machine", a "Manufacture", a "composition of Matter", and therefore is not within the Statute (Rev. Stat., Sec. 4886).

All these elements of operation being old, and old in the same art, the conclusion seems unavoidable that as a patent for a method, the patent is void.

English Decisions.

Much has been said by complainant as to an alleged variance between certain decisions of foreign courts and the decisions of the Courts of the United States in respect of Method claims.

This, so far as it exists at all, is only an *apparent* variance at best, and arises out of the different statutory provisions existing in the two countries.

The patent law of England was fixed by "The Statute of Monopolies" (21 Jas. 1, c. 3), in 1623, by which a limitation was placed on the power of the King, previously exercised by him at his royal pleasure in creating monopolies of all kinds by Letters Patent—and often, as history records, to the great injury of the Realm.

By Section 6 of that Statute it was provided that the restriction of royal power thereby created—

> "Shall not extend to any letters and the grants of privilege for the term of fourteen years or under, hereafter to be made, of the sole working or making of *any manner of new manufactures* within the realm, to the true and first inventor and inventors of such manufactures."

In respect of what could be patented—"any manner of new manufactures"—this continued to be the law of Great Britain, from that date (1623) until 46 and 47 Vic., c. 57 (1883), and in the latter the term "an invention" is used instead. Sec. 5, (2).

The general terms thus employed have been held by the English Courts—and with commendable liberality—as including any and all inventions of a patentable nature whether (1) a method or process, (2) a machine, (3) a product or article of manufacture, or (4) a composition of matter. Any and all such subdivisions of patentable subject-matter were held to come within the terms "new manufactures" as used in the Statutes of Monopolies (21 Jas.) or "an invention" as in 46 and 47 Victoria. Hence in the English Court the practice grew up of construing the claim, usually formulated in general terms, as covering any actual invention which the patent disclosed, whether a method or machine or product. And as any claim properly formulated, might cover any one or two or all three of these subdivisions, the English Courts seldom if ever had occasion to define judicially the difference between them. All three were patentable, and patentable under the same form of claim.

What the English courts had thus no occasion to do, our courts always have done and under our statute have felt compelled to do, and therein lies the apparent variance—for it is only apparent and not real.

In the United States, the statutory provisions in this regard are and always have been quite different from the English—that is to say, from the earliest enactment on the subject on April 10, 1790 (1 Stat. at Large, 109) down to the present time, the statutes in force have always specified with particularity the different subdivisions of invention for which patents might be granted. Practically, however, nearly all the decisions of the United States Courts on the matter now in hand have been made under Section 6 of the Act of 1836 (5 Stat. at Large, 117), which Act was a codification of all laws then in force on the subject. In this Act (Section 6), the subject-matters of invention for which patents could be granted were those specified thus:

> "Any new and useful art, machine, manufacture or composition of a matter or any new and useful improvement on any art, machine, manufacture or composition of matter," etc.

The Act of 1790 contained subtantially the same provisions.

Such has been the law in the country to the present time, for the same provision is continued in Rev. Stat., Section 4886.

Hereunder the United States Courts have drawn careful and accurate distinctions between the various subject matters of invention thus specified. Thus a claim for a machine could not be construed as covering a method, and *vice versa*. Nor could a claim for a method be construed as covering a product. And thus it was that the United States Courts have defined what is or is not patentable as a method or process, whereas no such necessity ever existed under the laws and practice of the English Courts. Consequently in that particular question, the English decisions are not in point.

What we have thus said as to practice in the United States is well illustrated and confirmed as well in the *Westinghouse vs. Boyden* case, where, the claim being for "mechanism," the Court refused to construe it as covering a "process" (170 U. S., 557).

And to the like effect see,

Merrill vs. Yeomans, 94 U. S., 568.
James vs. Campbell, 104 U. S., 356, 376.
Powder Co. vs. Powder Works, 98 U. S., 126.

The distinction in principle between inventions of processes and inventions of machines is however as well established in Great Britain as in this country. The leading cases on this subject, *Neilson vs. Thompson*, Web. Pat. Case, 275, for the use of a hot blast in the manufacture of iron, and *Crane vs. Price*, 4 M. & G., 580, for the use of anthracite coal and hot blast in the manufacture of iron, have been cited by the Supreme Court in the consideration of process patents (*Tilghman vs. Proctor*, 102 U. S., 707). The classification of the subjects of patentable inventions is clearly stated in the case of *Rex vs. Wheeler*, 2 B. & Ald., 349, in which ABBOTT, C. J., said :

> "Now the word 'manufacture' has been generally understood to denote either a thing made which is useful for its own sake, and vendible as such, as a medicine, a stove, a telescope, and many others, or to mean an engine or instrument, or some part of an engine or instrument, to be employed either in the making of some previously known article, or in some other useful purpose, as a stocking frame, or a steam-engine for raising water from mines ; or it may perhaps extend also to a new process to be carried on by known implements or elements, acting upon known substances, and ultimately producing some other known substance, but producing it in a cheaper or more expeditious manner, or of a better and more useful kind."

In *Cannington vs. Nuttall*, L. R. 5, H. L. 205, where the subject of the invention was the application of external air to the sides of a tank, Lord WESTBURY said :

> "If, for example, I avail myself of the well-known expansive force of steam in order to effect a new object as a more beneficial result, and I introduce that by means of an apparatus constructed for the purpose of bringing this well-known expansive power into utility for my particular purpose, I have no right of invention in the discovery of that expansive force. My invention consists in the arrangement of the apparatus in order to receive that ordinary and well-known dynamic agent, and make it a fit instrument for effecting a new result. Here the refrigerating effect of the air upon the sides of the tank was not a thing for which *per se* a

patent could be claimed, but an apparatus so constructed as to bring into operation that particular property of the external atmospheric air so as to produce a most useful effect, constitutes an invention to which the merit of novelty attaches and for which a patent may be taken out."

The decisions of the French Courts also harmonize in principle with those of the United States, although the same distinction obtains in the law of France respecting claims that we have noticed above with reference to the law of Great Britain. In a standard French treatise, Pouillet's Traité Théoretique et Pratique des Brevets d'Invention, published in Paris in 1906, it is said in substance on pages 30–33:

"*Page 30.* He who first obtains a result, can he prevent others from obtaining the same result by other means? For example: he who, by the means of a chemical agent, deodorizes oil of petroleum without taking away its qualities of inflammability, can he prevent others from deodorizing it with mechanical apparatus of his own invention?

"For another example: he, who, by a particular disposition of a rifle gives to firearms a greater range than they have ever had, can he prevent others using the expansive force of a gaseous combination which they may have discovered, and obtaining with ordinary arms the same result? The question illustrated by these examples answers itself. We can not admit that the first author of a result can prevent experiment by others. The result is therefore not patentable in itself.

Page 32.

"Jurisprudence. It has been judged in this sense:

"1. That the idea of making a hat which will open or close, taken in itself and independently of the means of realization, constitutes only a result not patentable.

"2. That the idea of manufacturing several side scenes with a single piece of paper constitutes a non-patentable result.

"3. That one can not patent simply and in itself the idea of preventing subscribers of gas companies from taking gas outside of the hours determined in the contract.

"4. That a result is not patentable in itself and independently of the means employed to obtain it; for example, the fact of disposing iron, in manufacturing bent axle-trees, in such a way as to maintain the continuity and parallelism of fibers, well known conditions of

the strength of cohesion and of solidity of the iron, constitutes only a result which can not be the subject of a valid patent.

"5. That a patent obtained for machinery which accomplishes simultaneously the shearing and the teasling of fabrics, although previously these two operations were accomplished separately, can only be valid for the machine and not for the simultaneity of the operation, which is only a result.

"6. That the fact of rendering less expensive the previously known manufacture of iron is not patentable.

"7. That the object an inventor has in view in creating a product or a process can not be subject of a patent. The invention consists only in the means of execution and realization of the object. For example, the inventor of a kind of shoeing called "periplantaire," which resulted in the maintenance of elasticity of the horse's foot, can not prevent such elasticity from being obtained by another system called "sous-plantaire," using a different horseshoe.

"8. That the protection which the patent procures must be limited to the system which the inventor has found and described, and can not extend to any other system giving an identical result."

Commercial Success.

In the case at bar the complainant has made large claims of commercial success for the invention in suit and has argued that patentability of the invention is indicated thereby. The Circuit Court of Appeals for the Sixth Circuit also bases its opinion to some extent upon such testimony, and concludes in distinguishing the case at bar from the case of *Risdon Locomotive Works vs. Medart*, 158 U. S., 68, by stating—

"The vital differences between such an invention and this are that in this a new and different result is produced, a difference so great as to supplant all previous results."

In this regard we submit there is, in the decision of the Court of Appeals, error both of law and of fact. There is error of law because the complainant's patent is not of the nature which can be aided by proof of commercial success. The success was due to the merit of the *machine;* the patent for the *machine* is not in issue; and no amount of commercial success of the *machine* can prove that a patent for the *method or function* of the machine is patentable.

In *Duer vs. Corbin Lock Co.*, 149 U. S., 223, this Court said:

> "It is true the Orum lock seems to have gained an immediate popularity, to have met with large and increasing sales, and to have had the usual effect of successful patents in stimulating the activity of business competitors to produce an equally useful and popular device. Were the question of patentability one of doubt this might suffice to turn the scale in favor of the patentee. But there are so many other considerations than that of novelty entering into a question of this kind that the popularity of the article becomes an unsafe criterion." * * * While the popularity of the Orum lock may be due to its greater usefulness, or to the fact that it was put upon the market just at the time when cabinet makers were looking for a lock of this description, it is certainly not due to any patentable feature in its construction."

There is an error of fact, for the mechanism or process disclosed by the patent in suit did not displace the means which had previously existed for the manufacture of expanded metal, and the success of expanded metal has not depended upon the patent in suit.

The facts are, that until the modern fireproofing buildings became largely used, there was little use for expanded metal. It was one of those fanciful things that suggest to the imagination, "something made from nothing," because the openings of the metal were not produced by cutting out pieces from the blank. It was thought that it could be used as a substitute for screening and window guards made by weaving strands of wire, but it developed that wire fabrics were more economical and better adapted for all such uses. This is the effect of the testimony of Golding (p. 98), and of defendant's witnesses (Kearns, p. 187, H. E. White, p. 210). Kearns states that the use of expanded metal other than for fireproofing and concrete construtions is not more than three per cent., and White states that it is negligible.

Golding says (p. 99, Q. 171):

> "Expanded metal was not made commercially until after the invention of the Golding & Durkee process and machine No. 320,242 and 381,231. At that time the use of expanded metal as a concrete reinforcement was unknown, and the manufacturers licensed the patents last named undertook to

dispose of the products of the machines for fencing and other like purposes, but with very indifferent results, but I found that I could make lathing upon these machines by simply lessening the stroke of the upper blade, and after the machines had been so adjusted, they were run almost continuously on *lathing*." (Italics ours).

And again, on page 99, Golding states (Q. 171):

"It was not until about 1891 that I found use for expanded metal for concrete reinforcement. For this use a considerable quantity was sold and has continued to be sold until recently for a short span light concrete work, or for bonding concrete in long spans where the concrete was further reinforced by round steel rods, it not being possible by the machinery built to carry out the process of patent 320,242 to make expanded metal of sufficient strength to carry long span concrete work. We never could use steel plates of above a sixteenth of an inch in thickness." * * *

The witness Kearns also shows that the large use of expanded metal in recent years has been due to the growth of the concrete and fire-proof industry due to the erection of modern fire-proof buildings. He says, on page 186, Q. 67:

"There has been a very large increase dating from about 1893. In the use of expanded metal alone the use has grown from nothing up to sales by the different expanded metal companies aggregating nearly twenty million feet of the different meshes used in reinforcement, and there has been a relatively large increase in the sale of wire products and wire meshes for the same purpose.

"When we started business (the Eastern Expanded Metal Co.), in 1894, there was practically only two small mills engaged in the manufacture of Portland Cement in the United States. To-day there are over fifty, and the consumption has grown from a few thousand barrels of Portland Cement made in the United States, until to-day, the manufacture of American Portland Cement must aggregate between thirty and forty million barrels annually. Not all of that, however, going into the fireproof construction, but I

should say easily one-third of that amount has gone into fireproof construction alone. That is about the history of the business.

The witness Kearns, who for many years has been manager of the Eastern Expanded Metal Company and is familiar with the growth of the business, also shows that at the time of the commencement of this suit the process or apparatus of the prior Golding & Durkee patents was the only process used by the complainant and its licensees for making expanded metal of large mesh for concrete reinforcement, except at one factory in Pittsburg, where one of the complainant's licensees used the machine of the patent in suit for that purpose.

Mr. Kearns says on page 184:

"Q. 54. In February, 1904, the day of the commencement of this suit, were you in a position to know what companies were making and where you could procure the larger sizes of mesh under the cutting and stretching process in suit?

"A. Yes, sir.

"Q. 55. Who were making that and where was it procurable in this country?

"A. The Central Expanded Metal Co. were the only ones making it at that time in the United States.

"Q. 56. And at that time was or was not the Northwestern Expanded Metal Company making the large size mesh by the second process [the process of Golding and Durkee]?

"A. They were making it.

* * * * * * *

"Q. 58. And were you in a position to know whether the business was a success under the second process in suit?

"A. I know that the Eastern Expanded Metal Co. were uniformly successful from the day they commenced business and could have continued successful with only the old patents to work on."

Also, Kearn's Testimony on page 187, Qs. 87–89.

The complainant's own witness Meritt, one of the licenses, under the patents of Golding, admitted that one-half of the lathing

which he used himself or sold, was the product of the Golding & Durkee machines (p. 119).

At the works of the Western Expanded Metal Company on the Pacific Coast the Golding & Durkee machines were at the time this suit was brought still in use for making both lath and concrete reinforcing. *No machines of the patent in suit were used there* (Kearns, page 185, Qs. 61 and 62).

The complainant's witness, Kennedy, states (Ans. to Q. 5, page 199):

> "Large amounts of metal were made into expanded sheets by machines operating as described in this patent on very thin sheets forming comparatively large meshes, while meshes similar in size from the same gauge of thin plates could not be formed at all by the machines described in the patent in suit and in patent to Golding No. 581,713, which latter machines can only work where the thickness of the metal is considerably greater in proportion to the size of the mesh than is necessary in the case of the arrangement set forth in the patent to Golding No. 320,242."

The complainant's own witness Curtis, who had long been identified with the art, admitted that up to and after the date of bringing this suit, the only factory using the machines suggested in the patent in suit for making reinforcing material was the factory of Chess Brothers, near Pittsburg. At the factory in Chicago, where the Northwestern Expanded Metal Company had its plant, all the concrete reinforcement was made with the Golding & Durkee machines until after these suits were brought.

When asked whether the increase in the use of expanded metal during recent years was due to the patent in suit, or to the machine described therein, the witness Kennedy stated (Q. 18, p. 204):

> "It is due to neither; but simply corresponds with the enormous increase in the use of steel in the construction in other lines. Large modern office buildings have called for vast quantities of structural steel, and the increasing use of concrete has brought about the consumption of large amounts of expanded metal for strengthening it, and also a great deal of expanded metal has been required for partitions in fireproof buildings. I have no reason to think that the use of

the new type of machines has made any appreciable amount of expanded metal used. There has been an equally large increase in the use of bars for use in concrete, which bars are made in many different patterns and the consumption of which is entirely independent of any particular form of bar or process of making them. The new Golding machine has some mechanical advantages for certain classes of work; but to enumerate the steps which this machine goes through in forming a plate of steel and call them a process seems absurd and far fetched."

The record also shows that the complainant's licensees have continued, up to the time of taking the testimony, to advertise expanded metal made by the apparatus of the prior patents. This appears in the testimony of Golding (p. 109):

"x-Q. 210. I show you an advertisement on the cover page of the 'Construction News', a Chicago publication, dated April 28, 1906, which contains a cut of a piece of expanded metal in the following words:

KNO-BURN
Steel Plastering Lath
is the old reliable
First on the Market and Still Leads
Fireproof—Strongest—Stiffest.
NORTHWESTERN EXPANDED METAL COMPANY,
799 Old Colony Building, Chicago.

"Is not this an advertisement of the product of the said Golding & Durkee patent?

"A. It is."

We submit that it is not proper, in the face of such testimony, for complainant's counsel to contend that the alleged process of the patent in suit was revolutionary in its result or that it created a new art. We have gone into this subject at some length, because it seems to have been misunderstood by the Court of Appeals of the Sixth Circuit, else the Court could not have said that the result produced by the complainant's process was new and so different as to supplant previous results. That is the theory of counsel, but it is not justified by the record.

The fact is, as we have stated above, that the patentee has invented simply a new machine, better and stronger than other machines and better capable of working heavy material. Heavy material has had in recent years a large demand, owing to the increase in the number of fireproof buildings; and, although the better machines may make a more regular, better product, they certainly do not make a different product. Extensive use, even if proved, cannot render an unpatentable device patentable, nor can the function of a machine be claimed simply because the machine produces a better product.

In *Smith vs. Nichols*, 88 U. S., 521, this Court said:

> "All the particulars claimed by the complainant, if conceded to be his, are within the category of *degree*. Many textile fabrics, especially those of cotton and wool, are constantly improved. Sometimes the improvement is due to the skill of the workmen, and sometimes to the perfection of the machinery employed. The results are higher finish, greater beauty of surface, and increased commercial value. A patent for the better fabric in such cases would, we apprehend, be unprecedented."

Brief for Bradford and Others, Defendants, No. 289, October Term, 1907.

In the suit decided by the Circuit Court of Appeals for the Third Circuit wherein Bradford and others are the defendants, the opinion of the Court of Appeals concluded as follows (Rec., p. 248):

> "'Patent are not granted for abstract ideas, principles, modes of operation, functions or results of machines, but underlying every patentable invention is the idea of means. The thing patented is the concrete expression of this idea, the mechanism by which it is reduced to practice (Burr v. Durkee, 1 Wall, 532; O'Reilly v. Morse, 15 How., 62). It is this which must be set forth in the claim in distinction from discovery, or conception, idea or mode of operation which it embodies.'
>
> "Without extending this opinion, we think the principles laid down by the Supreme Court in Risdon Iron Works v. Medart, 150 U. S., 68, and the other cases, both in that court and in the lower courts, which have recognized these principles as valid—many of them are cited on the appellant's brief—require the reversal of the decree appealed from with instructions to the Circuit Court to dismiss the bill at the costs of the complainant."

The defendants' machine charged in this case to infringe is unlike the machine illustrated in the patent in suit in every particular except in respect of its function or ultimate result. It therefore exemplifies the invalidity of the patent, in that it includes within its scope all mechanisms however various in construction which do the work that the apparatus of the patent in suit was planned to do.

Thus the record shows:

1. The machine of the complainants' patent has vertically reciprocating knives arranged in a single line end to end and adapted to operate in a straight line along the edge of the sheet.

The defendants' machine has not a series of reciprocating knives, but on the contrary a series of rotary knives, each of which resembles the rotary cutting knives of the Ohl patent No. 475,700.

3. The defendants' machine does not make a series of cuts extending along the edge of the sheet, but the rotary cutters are in

stepped position relatively to the line of feed of the metal sheet, which is not delivered at right angles to the line of cutters as in the patent in suit but obliquely thereto, so that the cuts are made upon the sheet in oblique or stepped fashion in the same order as with the apparatus of the Golden & Durkee "second process" patents.

Therefore, in respect of the order and time of the slitting, and the relation of the slits, the operation of the defendants differs from that disclosed in the patent in suit and resembles that of the prior state of the art. The resemblance to the method of the patent in suit is that the machine of the defendants, in cutting and opening the strands, happens to stretch them to about the same degree as does the complainants' machine, and this is a mere incident or result of the kind of knives used by defendants or the knives of the patent of Ohl.

Therefore, while it is true that the operation of the defendants' machine comes within the definition of the claim of the patent in suit in that it produces expanded metal by forming alternately placed slits and stretching the strands, the resemblance is not one of mechanism, but of result.

The defendants' machine is described in the testimony of E. S. Bradford, one of the defendants (Rec., pp. 117-125); in the testimony of complainants' witness Golding (pp. 11-13); and in the testimony of defendants' witness Coombs (pp. 137-140). It is also illustrated in a Patent No. 664,379, granted December 25, 1900, to E. S. Bradford, one of the defendants (Rec., p. 95). While it is somewhat difficult to pick out the details of the machine, its general features, so far as now material, are easily understood. They are best illustrated in Figs. 1 (sheet 1), 3 and 11 (sheet 3). The cutters in pairs, one of each pair directly over the other, are arranged in series twenty-three in number along the edge of a long table or frame which carries the driving mechanism, as on the front of Fig. 1 and along the lower edge of Fig. 3. Each upper cutter has an edge of blunt saw-teeth, (d', Fig. 1), and each such tooth as the cutter revolves, acting across the edge or corner of the cutter beneath, cuts a strand and the point of the blunt tooth pushes it down, and somewhat stretches it. The feed of the sheet or plate is angular along the oblique line of guides m^2 of Fig. 3, and as further illustrated in Fig. 11. Also—and this is an important fact—the feed is continuous and uninterrupted, that is, each sheet or plate on being fed into the machine, goes straight through, endwise, without stopping or changing posi-

tion relative to the line of feed, until it is discharged from the machine, a completed product.

Owing to this slight obliquity of feed (see Fig. 11) relative to the alignment of the series of cutters, the sheet is attacked first by a single roller-cutter at one corner of the sheet, then the second roller commences to cut, then the third, and so on. In consequence a single cut at the corner of the sheet is first formed and then cuts are made diagonally, *en echelon*, as the sheet advances, three cuts, five cuts, seven cuts, etc., along each line and simultaneously until the sheet is entirely cut and expanded, the last step being the cutting of a single mesh at the extreme corner diagonally opposite to the first cut.

The metal blank when fed into the machine, goes straight through endwise, at a single feed, without stop or cessation or renewal of feed. In this respect it is like the machine of the patent of Ohl. With the mechanically driven feed rollers of defendants' patent, which are always going while the machine is in operation, it could not be otherwise; and the witnesses on both sides so describe the machine.

A serious error occurs in complainants' brief in the representations of the operation of the defendants' machine. The illustration shown for example on page 55 of the brief, in which the machine is represented as first making with one rotary cutter a single series of cuts along a part of the edge of the sheet, and then with a second cutter making a parallel series of cuts back of them, is manifestly an incorrect and impossible mode of operation, for to make the cuts in this way the cutters would have to be separated from one another about one-third of the length of the sheet and to be set at right angles to the line of the feed, whereas they are in close proximity and are oblique to the line of feed.

The fact is that the cuts are produced by the rotary cutters of defendants' machine in stepped order and in the same relation as in the operation of the machines shown in the drawing of the Golding & Durkee patent No. 320,242, and illustrated on page 40 of this brief.

The incorrectness of the complainants' brief in this respect and the fallacy of the argument based upon this wrong description are shown by comparing it with the correct description of the same machine contained in complainants' brief in the Court of Appeals in this case, where complainants' counsel said on pages 44, 45:

"It seems to have been Bradford's idea, as it is disclosed in his patent and in the machine constructed under it, that the cutting, bending and elongation or stretching out of the strands, under the process described by Golding in the patent in suit, could be effected by rotary cutters, instead of by reciprocating knives.

"He employs a bed plate on which the metal sheet is supported and fed. Above this bed plate on one side is a series of feed rolls *f* and below them is a series of circular lower rotary cutters *e*. Upper rotary cutters *d* having serrated peripheries or cutting edges are journalled eccentrically on the tubular shafts of the upper feed rolls *f* so as to be slightly to the right of the line through the axes of the rolls *f* and lower cutters *e*. The serrated edges *d* of the cutters *d* work over the face of the circular cutters *e* (see Fig. 12 of Bradford Patent, App. Rec., 148).

"The metal is fed diagonally over the bed plate between the rolls *f* and cutters *e*, and as the outer edge passes under the upper rotary cutters *d*, it is slit and the strands thus formed are bent down and at the same time elongated or stretched out by the serrations or prongs d^1 of the upper or 'expanding cutters' *d*. On the next forward feed the metal passes under two expanding cutters and two half meshes are cut, expanded and elongated in the second row; on the next feed the metal passes under three expanding cutters and three half meshes are cut, expanded and elongated in the third row, and so on until the entire sheet is cut and expanded into series of rows of meshes, the strands of which have been elongated or stretched out by the action of the cutting prongs or projections. These opened slits or meshes are alternately arranged and for this purpose the expanding prongs or projections of successive expanding cutters are arranged in alternate angular positions. The object of this arrangement is thus explained by the patentee Bradford (p. 2, lines 118–126):

"'The reason for this arrangement is obvious. In the formation of the meshes A^1 in the sheet A each alternate row of half meshes (see Fig. 12) is cut by alternate cutters *d* and the point A^2 of expansion of the meshes A will therefore not be in the same line in adjacent rows.'"

The essential resemblance of the defendants' machine to the machine of the Golding and Durkee "second process" is made manifest by this description.

It is significant as indicating the true scope and functional character of the patent in suit, that in undertaking to prove infringement the complainants were apparently not concerned to prove that the means employed by the defendants were identical with those of the patent in suit, but only to prove that the product of defendants' machine had alternating slits and stretched strands and that the sheet was of the same length as the original blank. In other words, the proof of infringement was by showing identity of *results* and not of *means*, and this is shown by the testimony of Golding the complainants' patentee and chief witness. Mr. Golding says on page 13:

> "I did not undertake to retain in my mind the actuating parts of the machine, but took careful note of the relative position of the cutters and of their effect upon the metal, and with the exception of the cutters being much more rounded than are shown in the view of the cutting discs described in the patent, their operation was to cut and simultaneously stretch the strands forming the meshes."

Again, at the bottom of page 12, the witness says:

> "As previously stated, the finished sheet was practically the same length as the blank sheet from which it was cut. *This is an inherent necessity* for the reason that the machine makes one-half of a mesh at each cut, and the strands forming such half-mesh are rigidly fixed to the metal which forms the intersections of the strands and which remain a part of the whole uncut sheet until the next half diamond, behind it, and breaking joint with it, is produced." (Italics ours.)

In answer to x-Q. 44, on page 16, the witness said:

> "x-Q. 44. As I understand, you made no measurements of the length of the sheets worked upon either before or after the operation?
>
> "A. I had no rule with me to measure it, but it was the first thing I asked Mr. Bradford when I met him whether the

product was the same length as the sheet, and he replied in the affirmative. I did this with a view of having him commit himself upon that point."

The foregoing constitutes substantially the complainants' proof of infringement, and if it is true that they have a valid patent for a result or a function or a mode of operation of a species of cutter employed in the practice of an old process of making expanded metal, then their charge of infringement is established, but otherwise their case must fall.

Indeed, for the purpose of maintaining their case against these defendants the complainants have been forced in their proofs and arguments to present their patent in its baldest form as the abstract function of a machine, as it is, and to define it in a way which in the other suit against the General Fireproofing Company they have been forced to admit would result in its invalidity. For the purpose of illustrating this and showing the impossibility of finding a patentable ground on which to base this invention without inconsistency and disregard of the prior state of the art, we quote a paragraph taken from the brief of the complainants in the Circuit Court in the Bradford case and compare it with another paragraph taken from complainants' brief in the present appeal.

In their brief in the Circuit Court for the Eastern District of Pennsylvania the complainants said (p. 39) :

> " It has been shown that under the new process the sheet was not shortened, and the meshes were all square with one another, were of uniform width, and could be made from thicker, heavier and consequently stronger metal. All of these are very great and important advantages, and rendered the product incomparably better and more useful to the public, but they are, after all, merely the *incidents or results of* the real meritorious feature, *in which the whole novelty and merit of the improvement resides—and that feature is the elongation or stretching out of the strands simultaneously with the operation of cutting and bending.*" (Italics ours.)

To show that the invention thus defined is old, it is only necessary to compare the last clause of this quotation with the claim canceled by Golding in the Patent Office after rejection upon the patent of Ohl and thereby acquiesced in as unpatentable ("The

improvement in the art of manufacturing expanded metal consisting in simultaneously slitting the sheet and stretching the severed portions") ; and to compare it also with the admission made in complainants' brief in the present appeal on page 74, wherein the complainants say :

> "The Court very properly refused to sustain a patent for this act of simultaneously cutting, bending and stretching metal strands, and very properly decided that such an act involves nothing more than an abstract idea, which cannot be made the subject of exclusive appropriation. If this was what the patentee claimed, we would not question the soundness of the Court's decision. We concede, not only that the simultaneous cutting, bending and stretching of the metal strands is a mechanical act that cannot be made the subject of a patent, but also that it was an act which was well known and practiced in metal working. It is shown for example in the Ohl patent 475,700.
>
> "But the patentee does not claim a patent for this act of simultaneously cutting, bending and stretching metal strands. In that there was neither novelty nor patentable process."

The vague and theoretical character of the complainants' patent is further indicated by the fact that in choosing an expert witness to explain the patent, the complainants did not deem it necessary to call one skilled in the practical working of metals, but thought it sufficient to examine a mere theorist whose lack of knowledge of this art appears in the following quotation from his testimony (Bradford Record, pp. 57, 58) :

> "x-Q. 23. In your previous answers I understand that you have said that you personally have never made any of the expanded metal of the character under consideration or the kind described in any of the prior art patents, you have never seen such expanded metal in the actual process of manufacture and you have never seen any of the processes or apparatus described in any of the prior art patents, and you have never seen the process of the patent in suit carried out, and you have never seen a machine of the defendants in actual operation ; that is a correct statement, is it not ?
>
> "A. That statement is correct. I have, however, seen a

great deal of the expanded metal manufactured and used, and I have also had occasion to slit and expand models of cardboard and paper in considering expanded metal structures. I do not believe that anything that I have stated would be changed or modified in the smallest degree by the most thorough and full examination of any and all of the structures or machines or observation of the process of manufacture specified in your question. Such examination and observation are not at all necessary to arrive at a clear and comprehensive understanding of the matters here involved."

We submit that the Circuit Court of Appeals for the Third Circuit was right in adjudging the patent in suit to be invalid, and that its decree should be affirmed; that the Circuit Court of Appeals of the Sixth Circuit was in error in sustaining the patent, and that its decree should be reversed.

March 15, 1909.

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